



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
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Seattle, WA 98115

Refer to NMFS No:
NWR-2012-716

January 29, 2013

Teresa Raaf
Malheur National Forest
P.O. Box 909
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Re: Endangered Species Act Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for Administration of the Murderers Creek Wild Horse Territory/Herd Management Area Management Plan on the Malheur National Forest and Prineville District of the BLM, Upper South Fork John Day (HUC #1707020101), Middle Fork John Day (HUC #1707020102), Murderer's Creek (HUC #1707020103), and Lower South Fork John Day (HUC #1707020104) watersheds of the Upper John Day River subbasin, Grant County, Oregon.

Dear Ms. Raaf and Ms. Benkosky:

The enclosed document contains a final biological opinion (opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7(a)(2) of the Endangered Species Act (ESA) on the effects of the Malheur National Forest (MNF), the lead agency, and Prineville District (PD) BLM implementation of the 2007 Murderers Creek Wild Horse Territory/Herd Management Area Management Plan (Plan). In this final opinion, NMFS concludes that the proposed action is not likely to jeopardize the continued existence of MCR steelhead (*Oncorhynchus mykiss*) or result in the destruction or adverse modification of their designated critical habitat.

As required by section 7 of the ESA, NMFS is providing an incidental take statement with the opinion. The incidental take statement describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the Federal action agency must comply with to carry out the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species.

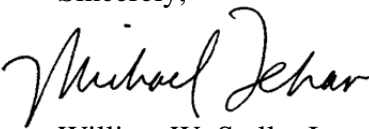


An appendix is included with the biological opinion that provides coordinated response to comments received on the October 15, 2012 draft opinion made available by NMFS.

This document also includes the results of our analysis of the action's likely effects on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes two conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These conservation recommendations are not a subset of the ESA incidental take statement's terms and conditions.

Please direct questions regarding this opinion to Randy Tweten of the Eastern Oregon Branch of the Oregon State Habitat Office, at 541.975.1835, x229.

Sincerely,


for William W. Stelle, Jr.
Regional Administrator

**Endangered Species Act Biological Opinion
and
Magnuson-Stevens Fishery Conservation and
Management Act
Essential Fish Habitat Response
for the**

Implementation of the Murderers Creek Wild Horse Territory/Herd Management Area
Management Plan on the Malheur National Forest and Prineville District of the BLM, Upper
South Fork John Day (HUC #1707020101), Middle Fork John Day (HUC #1707020102),
Murderer's Creek (HUC #1707020103), and Lower South Fork John Day (HUC #1707020104)
Watersheds of the Upper John Day River Subbasin, Grant County, Oregon

NMFS Consultation Number: NWR-2012-716

Action Agencies: Malheur National Forest, US Forest Service (Lead Agency)
Bureau of Land Management – Prineville District

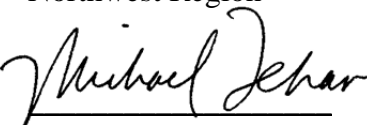
Affected Species and Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species or Critical Habitat?	Is Action Likely To Jeopardize the Species?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Middle Columbia River steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Yes	No	No

Fishery Management Plan That Describes EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes

Consultation Conducted By: National Marine Fisheries Service
Northwest Region

Issued By:


for William W. Stelle, Jr.
Regional Administrator

Date: January 29, 2013

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List of Acronyms and Abbreviations

AML	Appropriate management level
AR	At risk
AUM	Animal unit month
BA	Biological Assessment
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CH	Critical habitat
CHART	Critical Habitat Analytical Review Team
CWA	Clean Water Act
DMA	Designated monitoring area
DPS	Distinct population segment
DQA	Data Quality Act
ECA	Equivalent clearcut area
EFH	Essential Fish Habitat
EOY	End of year
ESA	Endangered Species Act
ESU	Evolutionarily significant unit
FAR	Functioning at risk
FDA	Food and Drug Administration
F	Fahrenheit
FR	Federal Register
FS	Forest Service
HSUS	Humane Society of the United States
HUC	Hydrologic unit code
INAD	Investigational new animal drug
IPCC	Intergovernmental Panel on Climate Change
ISAB	Interagency Scientific Advisory Board
IC-TRT	Interior Columbia Technical Review Team
JDR	John Day River
LAA	Likely to adversely affect
LOC	Letter of concurrence
LJD	Lower John Day
LWD	Large woody debris
MCR	Middle Columbia River
MFJD	Middle Fork John Day
MFJDR	Middle Fork John Day River
mm	Millimeter
mi	Mile
MNF	Malheur National Forest

MPG	Major population group
MPI	Matrix of pathways and indicators
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSRA	Most sensitive riparian area
NA or N/A	Not applicable
NAS	National Academy of Science
NEPA	National Environmental Policy Act
NFJD	North Fork John Day
NFJDR	North Fork John Day River
NLAA	Not likely to adversely affect
NM	Not monitored
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPCC	Northwest Power and Conservation Council
NPF	Not properly functioning
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
OHV	Off-highway vehicle
OHW	Ordinary high water
PCE	Primary constituent element
PD	Prineville District - BLM
PDC	Project design criteria
PE	Project element
PF	Properly functioning
PFC	Properly functioning condition
PIBO	PACFISH-INFISH biological opinion
PWSWA	Philip W. Schneider Wildlife Area
PZP	<i>Porcine zoonae pellucida</i>
RHCA	Riparian habitat conservation area
RM	River mile
RPA	Reasonable and prudent alternative
SA	Streambank alteration
SFJD	South Fork John Day
SFJDR	South Fork John Day River
TMDL	Total maximum daily load
UGNHS	Utilization of grass and non-hydrophytic species
UJD	Upper John Day
UJDR	Upper John Day River
U.S.C.	United States Code
USFS	US Forest Service

USFWS	US Fish and Wildlife Service
USGCRP	US Global Change Research Program
VSP	Viable salmonid population
WB	Woody browse
W/D	Width to depth ratio
WHGO	Wild horse gather operations
WHMP	Wild horse management plan
WMA	Wildlife management area

1. INTRODUCTION

This Introduction Section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531, *et seq.*), and implementing regulations at 50 CFR 402.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801, *et seq.*) and implementing regulations at 50 CFR 600.

The opinion, incidental take statement, and EFH conservation recommendations are each in compliance with the Data Quality Act (44 U.S.C. 3504(d)(1) *et seq.*) and they underwent pre-dissemination review.

1.2 Consultation History

On January 10, 2012, the Malheur National Forest (MNF) requested consultation on the implementation of the 2007 Murderers Creek Wild Horse Territory / Herd Management Area Management Plan (WHMP). The MNF determined that the proposed action is likely to adversely affect Middle Columbia River (MCR) steelhead and their critical habitat. This opinion is based on information provided in the biological assessment dated January 10, 2012, and received by NMFS on January 12, 2012, the May 25, 2012 MNF clarification letter received by NMFS on May 29, 2012, the July 5, 2012 email from MNF updating the proposed horse gathering schedule, the MNF's final 2011 End of Year Livestock Monitoring Report received on June 16, 2012, the Prineville District (PD) of the Bureau of Land Management (BLM) 2011 End of Year Livestock Monitoring Report received on July 5, 2012, updates to the 2012 horse gathers to date received on October 10 and December 5, 2012, the December 12, 2012 package of supplemental information that included MNF responses to comments received on the October 15, 2012 draft Biological Opinion during the agreed upon comment period, as well as other telephonic and electronic sources of information. The appendix to this final opinion includes an assemblage of the comments, with responses, to the October 15, 2012 draft opinion received from MNF as supplemental information for purposes of concluding this consultation on implementation of the MNF/PD WHMP. The December 12, 2012 supplemental package helped inform this final document, including revisions to the draft opinion and incidental take statement. Changes were made to this final document beyond those referenced in the appendix. A complete record of this consultation is on file at the NMFS Eastern Oregon Branch Office, in La Grande, Oregon.

There is a lengthy history of prior consultations, most for livestock grazing, for the MNF and PD lands associated with the Wild Horse Territory/Herd Management Area Management Plan (MNF *et al.* 2007) of the Upper John Day River (UJDR) watershed. The PD consultations which

overlapped the geography included in this consultation addressed livestock grazing on four allotments that contain MCR steelhead; #4020 – Murderers Creek Allotment, #4052 -- Big Baldy Allotment, #4103 – Rockpile Allotment, and #4164 – Corral Gulch Allotment. For the MNF, the Murderers Creek Allotment is entirely contained within the wild horse territory. Fields Peak Allotment of the MNF is outside and to the northeast of the ‘designated’ Territory, contains the headwaters of Murderers Creek, but is sometimes used by the wild horse herd, and is therefore, within the identified ‘action area’ for purposes of this consultation (see Section 1.4, “Action Area”).

Past consultations for the PD portion of the wild horse territory include:

1. A letter of concurrence (LOC) was issued on June 28, 2000, for those livestock allotments which may affect, but are “not likely to adversely affect” (NLAA) MCR steelhead (refer to NMFS No.: 2000/00721).
2. A biological opinion (opinion) was completed on January 17, 2001, for calendar years 2000 and 2001 for allotments which may affect, and are “likely to adversely affect” (LAA) MCR steelhead (refer to NMFS No.: 2000/00944).
3. An amendment clarifying the Terms and Conditions was issued March 15, 2001, for the January 17, 2001 opinion.
4. NMFS issued an opinion on October 21, 2002, to the BLM for the 2002 and 2003 grazing seasons for the allotments determined to be LAA MCR steelhead by the BLM (refer to NMFS No.: 2002/00200).
5. A biological opinion, issued by NMFS to BLM on July 27, 2004, on the effects of authorizing annual grazing permits from 2004 - 2008 on BLM-administered allotments in the Upper, North Fork, and Lower John Day River subbasins for those allotments that were analyzed by BLM as may affect, and were LAA MCR steelhead (refer to NMFS No.: 2004/00383).
6. An LOC was also issued on July 27, 2004, for those allotments that were analyzed as may affect and were NLAA MCR steelhead by BLM (refer to NMFS No.: 2004/00659).
7. On June 27, 2008, NMFS concluded formal consultation with USFS and BLM within the states of Oregon and Washington on aquatic restoration activities under the Aquatic Restoration Biological Opinion (refer to NMFS No. 2008/03505).
8. NMFS issued a biological opinion on May 11, 2011, for the allotments analyzed in the Upper John Day River Basin (Big Baldy, Murderer’s Creek, and Rockpile allotments) for the period 2011-2015 that were determined to be LAA MCR steelhead by the BLM (refer to NMFS No.: 2010/00159).

Past consultations for the MNF lands associated with the wild horse territory include:

1. On January 29, 2010 informal consultation was concluded through tiering to the 2007 NMFS Blue Mountain Expedited Section 7 Consultation Process which addressed project design criteria for groups of actions that are NLAA for MCR steelhead and their critical habitat. The LOC covered NLAA activities that get reviewed by the Interagency Level 1 MNF consultation Team and included: some vegetation management activities; range management improvements; wildlife, fish and watershed improvement projects; road maintenance; low impact special use permits; and recreation and administrative site

management activities that do not rise to the level of LAA (refer to NMFS No. 2007/02970).

2. An LOC was issued December 8, 2000, by NMFS to the MNF for their wild horse gather during January 1 through March 1, 2001 (refer to NMFS No.: 2000/01318).
3. A follow-up LOC was issued by NMFS February 18, 2004, for wild horse gathers for the period Spring 2004 through 2008 (refer to NMFS No.: 2004/00101).
4. On June 27, 2008, NMFS concluded formal consultation with USFS and BLM within the states of Oregon and Washington on aquatic restoration activities under the Aquatic Restoration Biological Opinion (refer to NMFS No. 2008/03505).
5. On July 13, 2009, a determination of NLAA for horse gathers on MNF proposed for the period 2009-2014 was provided to the MNF from the interagency Level 1 Consultation Streamlining Team. This LOC determination tiered to the 2007 Blue Mountain Project Design Criteria programmatic consultation (refer to NMFS No.:2007/02970).
6. Six past biological opinions have been completed to date regarding livestock grazing on the MNF lands associated with the Murderer's Creek Wild Horse Territory and the associated effects on MCR steelhead (refer to NMFS Nos.: 2007/01290, 2006/01337, 2005/05693, 2004/00610, 2003/00610, and 2002/00510).
7. On April 2, 2012, NMFS issued an updated biological opinion for effects of livestock grazing on MCR steelhead for the period 2012-2016, on lands that overlap with the Murderer's Creek Wild Horse Territory (refer to NMFS No.: 2011/05362).

As a part of their forward-looking schedule of work, the MNF is intending to complete National Environmental Policy Act (NEPA) review on the Wild Horse territory in 2013 and will be generating a new wild horse plan (Wild horse territory / HMA management plan) associated with that effort. NMFS expects MNF will request ESA consultation on that updated wild horse management plan.

1.3 Proposed Action

“Action” means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

The action addressed by this consultation is the implementation of the Murderers Creek Wild Horse Territory/Herd Management Area Plan (Management Plan) by the MNF and PD for the remainder of the duration of the Plan through 2027. The name “Murderers Creek Wild Horse Territory/Herd Management Area” incorporates terminology for both the Forest Service (FS) and BLM. The FS uses the term “Territory” and the BLM uses the term “Herd Management Area” when describing areas designated for management of wild horses. A Memorandum of Understanding between the FS and BLM provides the FS with full responsibility for management of the wild horses within the Territory regardless of land ownership. The BLM has the responsibility for the adoption process as well as long-term horse holding facilities, beginning with delivery of horses to facilities in Hines, Oregon.

The BA presents three habitat and five horse population components as the proposed action.

Habitat project components include:

- Wild horse use of territory and adjacent lands: Existence of free-roaming wild horses within the Territory and adjacent lands year-round at an appropriate management level (AML) of 50-140 horses, averaging 100 horses. Wild horses consume vegetation, drink water, urinate and defecate, and migrate daily and seasonally.
- Maintenance of troughs, springs and ponds: These are maintained by grazing permittees to provide off-stream water for livestock, wildlife and wild horses. This activity is identified by MNF as part of wild horse management even though a majority of stock ponds and water troughs are placed and maintained as a part of livestock management program. Development of springs as a watering source is conducted by MNF or livestock permittees.
- Habitat monitoring: Upland habitat trend is generally monitored by condition and trend plots. Riparian area conditions are assessed by use of Proper Functioning Condition (PFC) assessments. Photo points are used in both upland and riparian monitoring. Annual utilization levels and distribution patterns will also be monitored. The MNF's Riparian Monitoring Strategy was presented in detail in the BA. For both the MNF and PD, the BA depends on use of upland and riparian habitat monitoring conducted as a part of livestock management program. This monitoring data is used as a means to understand habitat condition within the overlapping geography of several cattle allotments and the Murderers Creek wild horse territory.
 - In addition, as a part of the recent ESA consultation on livestock grazing on the MNF for the period 2012-2016 (NOAA-F. 2012), MNF stated that Project Design Criteria (PDC)#12 (section 4.1.2 of the associated BA) applies to Murderers Creek allotment¹. It reads: *"All pastures will be monitored prior to turnout. If endpoint indicators are at or within proximity to allowable use, cattle will not be allowed to turnout or will be moved to the next pasture."*
 - This PDC is specifically designed to assess wild horse and ungulate use in the allotment, and prevent additional stream/riparian habitat impacts through cattle turnout if riparian conditions warrant protection.

Wild horse population control project components include:

- Wild horse gathers: Collection and removal of excess wild horses to attain AML of 50-140 horses, averaging 100 horses. As described earlier, a 2009 consultation provides ESA and MSA coverage for this project element from 2009 to 2014. The ESA consultation for wild horse gathers currently in effect through 2014 incorporates a set of PDCs addressing on and off-road vehicle use, and are included as a part of the proposed action. This set of PDC has now become part of the PDC for livestock management activities on the MNF, and is used when monitoring or infrastructure maintenance activities take place. Since these monitoring and maintenance activities also incidentally serve similar purposes for wild horse management purposes, the PDCs also will minimize effects by staff or permittees for this action. They are:

¹ Email from S. Namitz, MNF, to S. Hovekamp *et al.*, NOAA-F, clarifying that PDC #12 applies solely to Murderers Creek allotment.

- Vehicles are not authorized to travel through seeps, springs or streams except for use of existing fords on road crossings;
- All refueling activities and fuel storage will occur at least 150 feet away from live streams;
- Off-highway vehicle (OHV) routes within 100 feet of streams will be camouflaged so that access routes do not become new trails and minimize disturbance to riparian vegetation;
- OHV travel off established roads within 100 feet of streams would occur only during periods when soil is dry.
- Wild horse population census. The Management Plan states that a census should be conducted at least every three to four years, however, the frequency is increased and articulated in greater detail as a part of this proposed action. Census may include any combination of the following methods: on foot; horseback; or using helicopters.
- Monitoring seasonal distribution of animals. Records of movement and identification of seasonal use areas are important to evaluate habitat impacts and to determine effects of proposed range improvements (*e.g.*, ponds, troughs, springs, fences) on the wild horse population. Data is collected to establish a pattern of movement that is representative of the animal's seasonal needs or the climatic pressures on the populations.
- Humane destruction. Euthanasia may be authorized for a wild horse with any of five specific conditions:
 - Displays a hopeless prognosis for life;
 - Suffers from a chronic or incurable disease or serious physical defect;
 - Requires continuous treatment for the relief of pain and suffering;
 - Incapable of maintaining a Henneke body condition score greater than two in a normal rangeland environment;
 - Suffers from a traumatic injury or other condition that causes acute pain.
- Fertility control. Unadoptable older male horses that are released back to the territory may be gelded. Fertility control on mares using injections of porcine zonae pellucidea (PZP) may be utilized. This would be coordinated with gather events. However, use of PZP requires an Investigational New Animal Drug Exemption and is termed field research with specific requirements. Permission to conduct research using PZP is covered under an Investigational New Animal Drug Exemption (INAD#8857) filed with the Food and Drug Administration (FDA) by the Humane Society of the United States (HSUS). All BLM wild horse management areas must provide approved gather plans and environmental assessments detailing the contraception research before the research can be initiated in any specific area. Permission must be granted by the HSUS. The BLM is currently working with the HSUS to put in place a Field Trial Plan for Wild Horse Fertility Control for the use of PZP under the stated guidelines. To date, the Forest Service has not entered into any research program for the use of the PZP vaccine. However, the opportunity may exist to initiate a research program under existing BLM protocol established in their Field Trial Plan for Wild Horse Fertility Control. Implementing a research program would require working closely with HSUS and the maker of the vaccine. The actual research plan would require the approval of HSUS.

MNF proposes to manage the Murderers Creek wild horse herd by removing (gathering) animals in a manner to attain the AML of between 50-140 animals, and maintain an average herd size of

100 animals over time. This management action is pursuant to the Hunting Wild Horses and Burros on Public Lands Act (or Wild Horse Protection Act) of 1959 (P.L. 86-234), and the Wild Free-Roaming Horses and Burros Act of 1971 (16 U.S.C. 1331-1340), as amended by the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et. seq.*) and the Public Rangeland Improvement Act of 1978 (43 U.S.C. 1901 *et. seq.*). The 2007 Management Plan provides the background and implementation guidance for managing the wild horses of the Territory. This consultation addresses the remainder of the 20-year Management Plan (through 2027). As indicated above, a new Wild horse territory/HMA management plan is under development for which a new ESA consultation is anticipated.

The MNF provided information stating it will strive to achieve the planned horse removal schedule displayed in Table 1 (below) while recognizing there are many factors that can influence the total number of horses removed in any given year. Factors affecting the number of horses collected in a given year include, but are not limited to weather, wildfire, and available capacity at receiving facilities. As of January 2, 2013, MNF has gathered and removed 200 wild horses from the Murderers Creek Territory, under the task order issued for the collection of a maximum of 200 animals by March 31, 2013. Given a 2012 estimated population of 257 individuals, removal of 200 would leave a population of 57, reflecting that the MNF has achieved the lower end of AML.

Should the MNF not reach its planned removal goal in any given year, the following year(s) planned removal would be adjusted to account for those numbers not removed in the previous year. It is the intent of MNF to conduct gathers annually until a population size near the lower end of the AML (50-140) is achieved. Once the population reaches the lower end of AML, gathers would continue only to maintain the population near the average of 100 horses. As such, gathers may not be conducted annually. With the information available at the time of initiating consultation, the MNF presented their calculated herd size for 2012, which was then used to develop the following years' proposed herd size and gathering strategy, to include proposed years of surveys (Table 1).

Table 1. MNF’s Original Summary of Murderers Creek Wild Horse Territory/Management Area Horse Population, Gathering Schedule, and Census Schedule Addressed by this Opinion, as described in the BA. Wild horse numbers do not include current FY2013 gather numbers (see above).

Fiscal Year	Count	Population Estimate*	Population Estimate with 20% Annual Recruitment	Planned Removal
2012	161 horses	173-213 horses	208-257 horses	95 horses**
2013		162 horses	194 horses	90 horses**
2014	Census	104 horses	125 horses	60 horses
2015		65 horses	78 horses	28 horses
2016	Census	50 horses	60 horses	***
2017-2027	Population Census and horse removal will occur on an as-needed basis in order to maintain the 50-140 AML, or average of 100 horses, in the Wild Horse Territory.			

* The population estimate for 2012 is derived from a winter 2011 aerial survey. The following years only the upper end of the range of population estimate is displayed.

** Horse gathering numbers agreed to on an interagency conference call held 06/27/2012.

*** The need for gathers in 2016 would be based upon Census results.

The BA provided the following discussion on the ability to see wild horses when doing helicopter surveys. This sightability establishes the modifier to multiply with the observed number, to reach the estimated population size.

According to the BLM and National Academy of Science, aerial wild horse counts have greater than 85% sightability probabilities for open areas with gentle terrain. Because the Murderers Creek Wild Horse Territory consists primarily of rugged terrain, of which a large percentage is heavily wooded, the sightability probability is much lower. Because there is little information for determining sightability of wild horse in this type of terrain, the detection rate on the latest aerial census (Jan 2011) was estimated to be approximately 67%. The rate was estimated by flight observer G. McFadden, BLM Wild Horse Lead for Oregon & Washington. He has 35 years of experience managing wild horses and has conducted approximately 75 census flights, logging over 500 hours of air time counting wild horses in Nevada and Oregon.

A detailed description of activities needed to capture, hold, and transport horses is found in the supporting documentation submitted by MNF for ESA consultation (MNF 2009a). This earlier consultation document addressed the Wild Horse Gather Operations (WHGO) for the period 2009-2014. The same WHGO methodology is presented by the MNF for use throughout the life of the Management Plan. As such, the WHGO is incorporated into this consultation, and is used to describe the MNF guidance and practices for horse gathering activities conducted under the Management Plan through 2027.

The WHGO describes the techniques used for capture, which includes ‘drive trapping’ by horse and riders or helicopters, and ‘bait trapping.’ The method used is dependent on weather, snow load, time of year, terrain, and available funds. Helicopter drives tend to be very costly, therefore, are used infrequently compared to horse drives or bait trapping techniques. Wild horse

traps, or pens, are portable 20- by 50-foot corrals strategically placed for the active (herding) or passive (baiting) method of capture. Riders actively drive wild horses into temporary wing fences that lead them into the corral after which they close the gates of the trap. Baited traps have an automatic or remote-operated spring-loaded gate that is triggered when horses are inside the corral eating the bait (hay, alfalfa, or supplemental feed). Due to lower costs and lower injury rate of horses, the MNF currently uses bait trapping without any herding, primarily in snow months (frozen ground minimizes impacts to soils), as their preferred method of capturing wild horses. No land-based motorized vehicles are used in the process of trapping animals, traps are located outside of the riparian area, and captured horses are held in traps less than 24 hours.

Horse holding corrals with sorting pens are larger than traps, and are usually located along the road system to facilitate horse transport. A concerted effort will be made to not place these facilities on or near streambanks or in a situation that will create adverse impacts to MCR steelhead or their habitat. Any snow plowing necessary to access horse corral sites will follow existing MNF road maintenance specifications previously consulted on (NMFS #2007/02970).

If helicopters are used as the gathering technique, all landing and refueling areas will be in prior approved sites and not within identified riparian habitat conservation areas (RHCA). Hazardous material spill control equipment and absorbent material will be on-site at all times of fuel use or storage.

The Management Plan states that a census should be conducted at least every three to four years. The MNF has identified a more frequent wild horse census to help in managing the population within the AML goals (See Table 1). The census may include any combination of the following methods: on foot; horseback; or using helicopters.

An updated table (Table 2) with current Murderers Creek wild horse population estimate was received from the MNF on December 12, 2012. The late summer 2012 survey census counted 161 horses with a projected population estimate of 257 head. To date through the first quarter of fiscal year 2013, an additional 200 horses were removed from the territory, thereby dropping the estimated herd size to approximately 57 horses as of January 2, 2013. This herd size is well within the targeted AML of 50-140 horses.

Table 2. Current (January 2, 2013) population estimate for the Murderers Creek Wild Horse herd, with past years survey and gather results.

Fiscal Year	Number of Horses Removed	Resulting Population Estimate	MNF Comments
2013	200*	57	*Includes 40 horses removed in September 2012, and all horses removed in FY2013, through January 2, 2013. Current population estimate doesn't include recruitment which will be applied in the spring of 2013.
2012	83	257	2012 census counted 161 animals. Applied correction factor of 7.5-32% undercount as described in Lubow and Ranson (2009) puts population estimate at 173-213. Recruitment of 20% brings total to 257.
2011	60	238	2011 census counted 132 animals w/an estimate of 198 total. Add the 20% recruitment to reach the estimated pop. of 238.
2010	46	231	Estimate based upon 2009 census and 2009/2010 removals.
2009	77	230	115 horses observed, used 100% correction factor, based on viewing conditions.
2008	136	460	
2006*	0	430	Conducted on the ground census from July to September 2006.
2005*	99	90	AML and Est. Pop. is 75% of total with BLM.
2004	55	193	
2003	6	220	
2002	0	193	
2001	53	165	Estimates
2000	0	180	Estimates

*Survey techniques and calculation methodology changed in 2006, resulting in a significant increase in population estimate from 2005.

1.4 Action Area

“Action area” means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02).

The action area for this consultation (displayed in Figure 1, below) includes all lands with MCR steelhead critical habitat encompassed by the delineated boundary of the 143,000-acre Murderers Creek Wild Horse Territory/Herd Management Area (Territory) on MNF, PD, state and private property. The majority of state lands within the Territory are contained within the Philip W. Schneider Wildlife Area (PWSWA). Located on lower Murderers Creek, the PWSWA was established in 1972 to protect and enhance winter habitat for mule deer and is currently managed

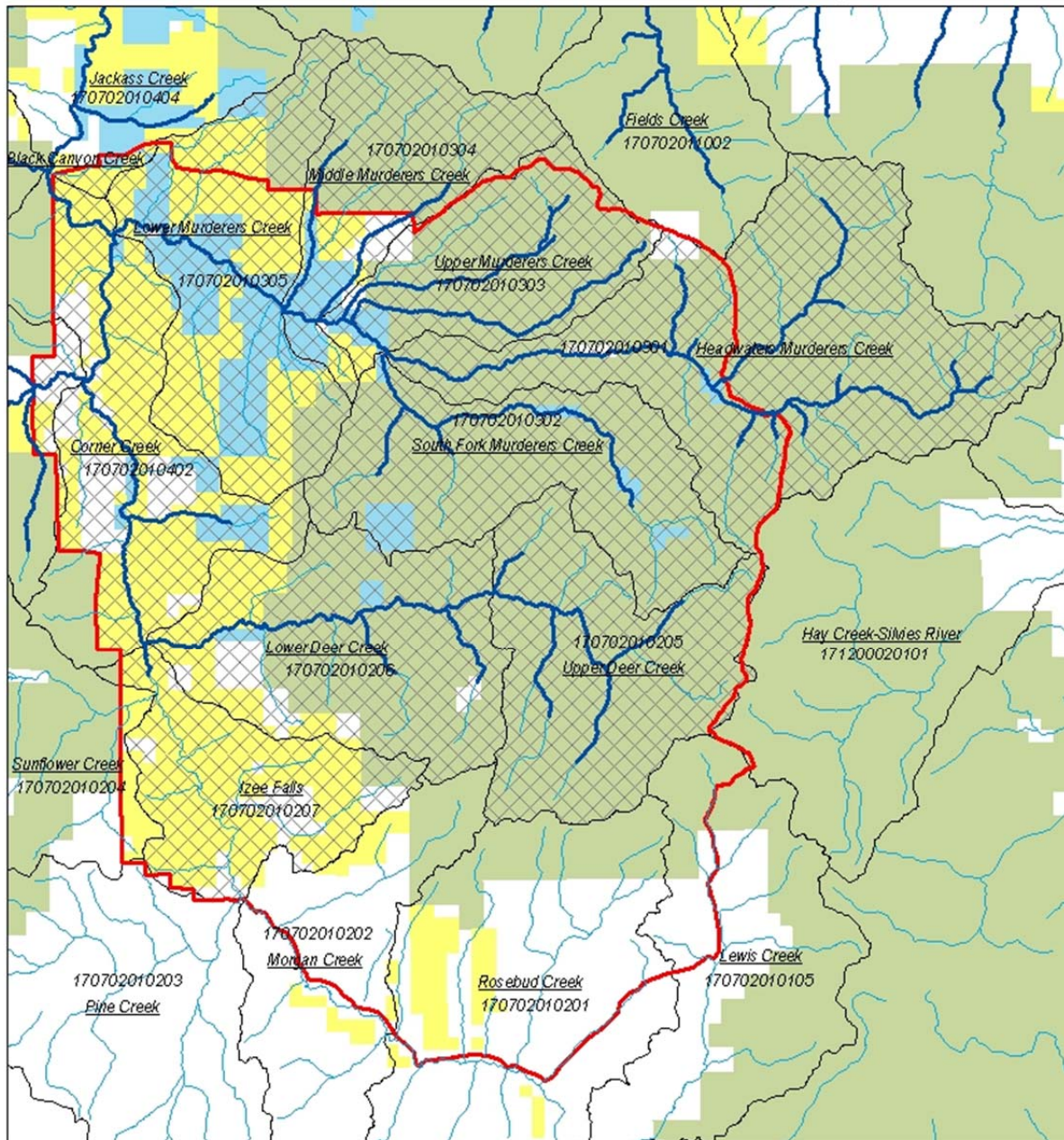
by the Oregon Department of Fish and Wildlife (ODFW). Straying of wild horses off of the identified Territory is most common along the northern/north-eastern boundary. As such, an additional 37,000 acres within the headwaters of Murderers Creek and Middle Fork Murderers Creek subwatersheds having MCR steelhead and critical habitat, located along the northern Territory boundary, and used by 10-15 horses, are included in the ESA action area. The action area also includes portions of Indian Creek, which is not designated critical habitat but is identified as occupied by MCR steelhead by the MNF. The BA did not identify any other stream reaches that were occupied by MCR steelhead but are not designated as critical habitat. Izee Falls, on the South Fork John Day River (SFJDR) at river mile (RM) 28.5 just upstream of where Deer Creek enters, is a natural and total barrier to MCR steelhead. As such, neither MCR steelhead distribution nor critical habitat is identified upstream of the falls.

The Territory is in eastern Oregon between the towns of Dayville, Mount Vernon and Seneca, approximately 30 miles southwest of John Day, Oregon. It is located along the western edge of the Blue Mountain Ranger District, MNF, Grant County, Oregon, in Townships 14S through 17S and Ranges 26E through 30E, Willamette Meridian. The Territory lies north of the Izee highway (County Road 63), south of Aldrich Mountain, east of the South Fork John Day River and west of Flagtail Mountain.

The Territory is within the UJDR subbasin [Hydrologic Unit Code (HUC) # 17070201] and drains into the SFJDR. Major drainages of the Territory (Figure 1) include: Murderers Creek, South Fork Murderers Creek, Deer Creek, Indian Creek, and the middle section of the South Fork John Day River.

Figure 2 displays land ownership with associated livestock grazing allotments that overlap with the Territory, along with highlighted stream sections displaying designated MCR critical habitat. Figure 3 shows the Murderers Creek Wild Horse Territory's 'high' and 'moderate' horse concentration/use areas in relationship to land ownership and designated MCR critical habitat. The majority of identified concentration areas are located on MNF lands, with the lower elevation, more winter-use areas residing on PD lands.

Murderers Creek Wild Horse Territory



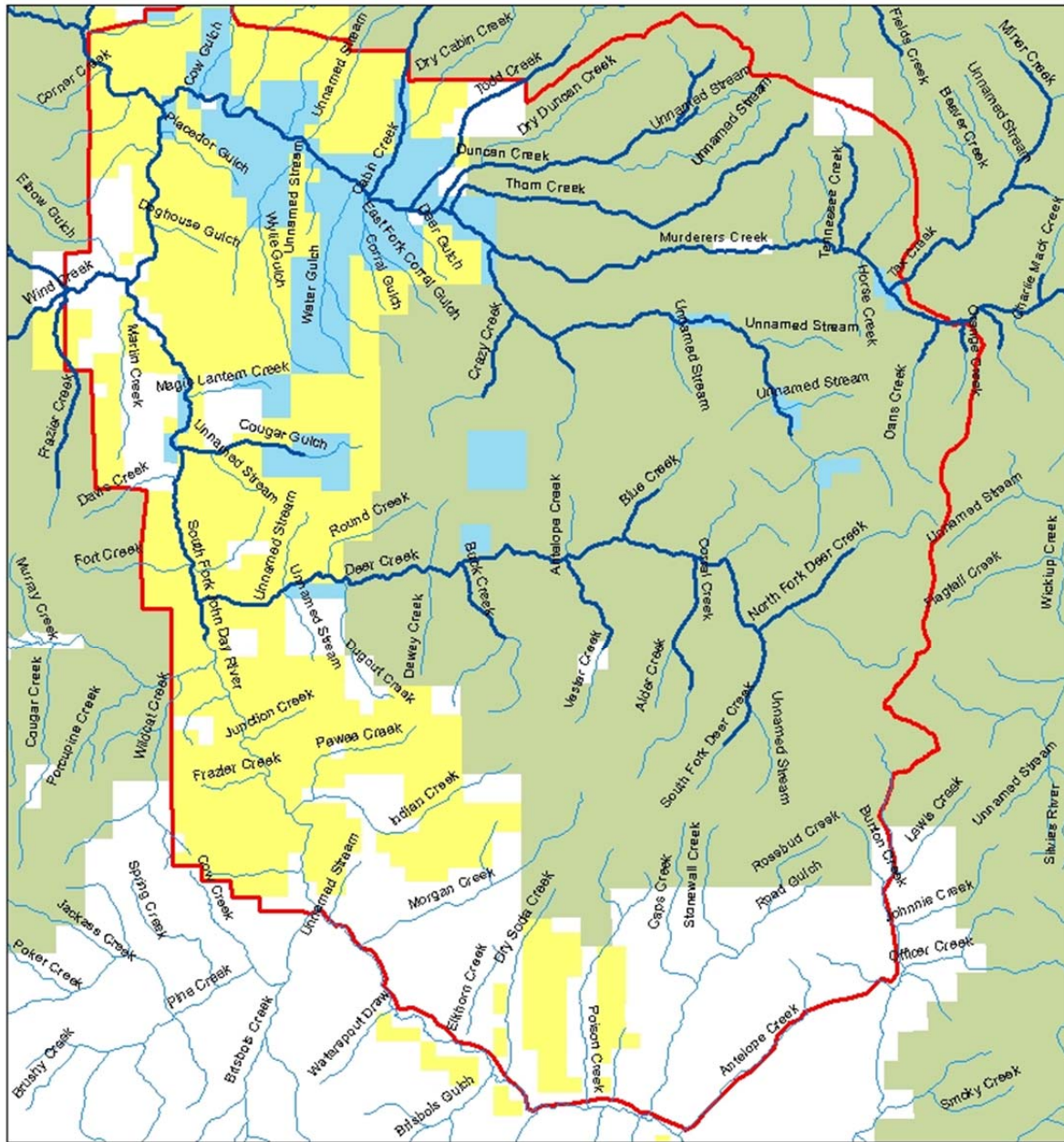
Legend

- CH_Steelhead_MCR
- Major Streams
- Wild Horse Territory
- HUC6
- ESA Action Area
- Bureau of Land Management
- US Forest Service
- Private Land
- State Land



Figure 1. Map of the action area for the Murderers Creek Wild Horse Territory/Herd Management Area with associated 6th-field Hydrologic Unit Codes identified within the Upper John Day River Subbasin.

Murderers Creek Wild Horse Territory



Legend

- CH_Steelhead_MCR
- Major Streams
- Wild Horse Territory
- Bureau of Land Management
- US Forest Service
- Private Land
- State Land



Figure 2. Map depicting land ownership and designated critical habitat (CH) for MCR steelhead in the Murderers Creek Wild Horse Territory/Herd Management Area.

Murderers Creek Wild Horse Territory

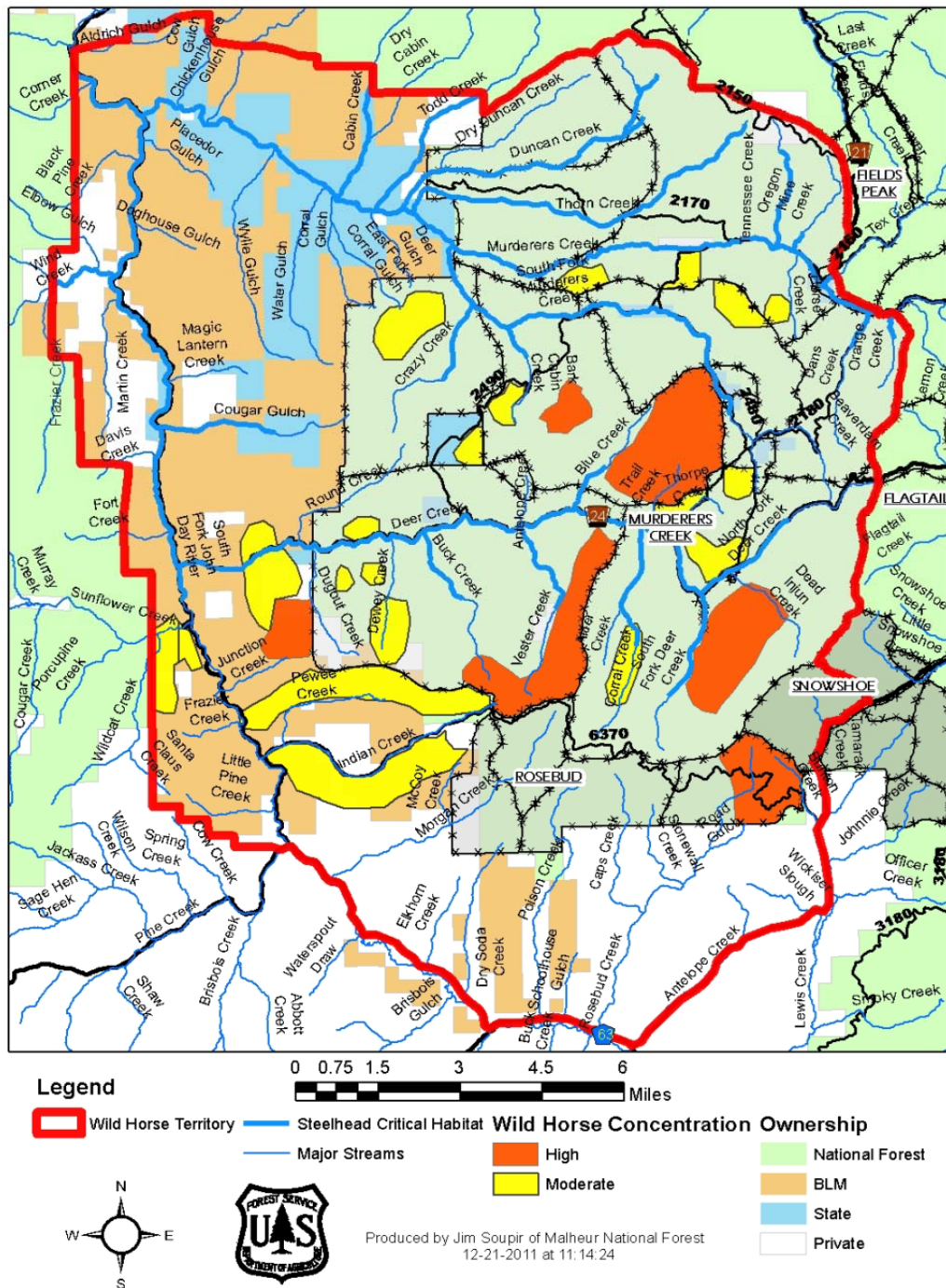


Figure 3. Murderers Creek wild horse Territory displaying high and moderate wild horse concentration use areas in relationship to designated MCR critical habitat.

A total of nearly 74 miles of MCR steelhead critical habitat are found within the Territory on MNF and PD lands. Table 3 lists those streams and their length of designated MCR steelhead critical habitat identified for MNF or PD lands.

Table 3. Miles of designated MCR steelhead critical habitat per named stream within the Murderers Creek Wild Horse Territory on MNF and PD lands.

Stream Name within Territory*	MCR Steelhead Critical Habitat (miles)	
	MNF-USFS	PD-BLM
Bark Cabin Creek	0.72	--
Blue Creek	1.06	--
Buck Creek	1.57	--
Cabin Creek	--	0.51
Corral Creek	2.51	--
Crazy Creek	1.64	--
Cougar Gulch	--	2.51
Dans Creek	0.81	--
Deer Creek	11.94	1.72
Duncan Creek	5.71	--
Frazier Creek	--	0.22
Murderers Creek	8.33	0.45
N Fork Deer Creek	2.22	--
Orange Creek	0.60	--
Oregon Mine Creek	0.41	--
S Fork Deer Creek	2.22	--
S Fork Murderers Creek	8.12	--
S Fork John Day River	--	8.62
Tennessee Creek	2.04	--
Tex Creek	0.34	--
Thorn Creek	6.96	--
East Tributary to Duncan Creek	0.47	--
West Tributary to Duncan Creek	0.13	--
Vester Creek	1.84	--
Sub-Totals	59.64	14.03
Grand Total	73.67 miles	

* Additional Information Memo from T. Raaf, MNF, to S. Hovekamp, NOAA-F. May 25, 2012.

Table 4 presents information on the juxtaposition of the MNF-identified wild horse use concentration areas with regard to MCR critical habitat either contained within or adjacent to the mapped polygons (from Figure 3).

Table 4. Wild Horse Concentration Use Areas and associated pastures, with number of stream-miles of designated critical habitat adjacent to, or contained within, the concentration area.

Allotment/Pasture	MNF-Identified Concentration Use Area*	Nearest Stream	Est. Miles of Critical Habitat**
Murderers Creek Allotment – MNF			
Timber Mountain	M #1	Corral Gulch	0.0
Timber Mtn. (State lands)	M #2	<i>uplands</i>	--
Oregon Mine	M #3	Murderers Creek	0.10
	M #4	Murderers Creek	0.25
	M #5	Horse Creek	0.0
Horse Mountain	M #6	<i>uplands</i>	--
Blue Ridge	M #7	Bark Cabin Creek	0.0
	H #1	<i>uplands</i>	--
	H #2	S. Fork Murderers Creek	1.25
Deer Creek	M #8	Headwaters South Fork Murderers Creek	0.0
	H #3	South Fork Deer Creek	1.5
	M #9	North Fork Deer Creek	0.75
	M #10	Corral Creek	0.25
Frenchy Butte	M #11	Deer Creek	0.50
	H #4	Vester Creek	0.25
	M #12	<i>uplands</i>	--
	M #13	<i>uplands</i>	--
	M #14	Dewey Creek	0.0
Rosebud Allotment - MNF	H #5***	Burton Creek	0.0
Big Baldy Allotment – BLM			
North Pasture	M #15	Deer Creek	1.0
	M #16***	Sunflower Creek/Wildcat Creek	0.0
	H #6	Dugout/Junction Creeks	0.0
South Pasture	M #17***	Peewee Creek	0.0
	M #18***	Indian Creek	0.0
Total Miles of Affected Critical Habitat = 5.85			

* **H**=high concentration area; **M**=moderate concentration area.

** Mileage extrapolated from MNF map presented in Figure 3, above.

*** Above Izee Falls on SFJDR, or outside distribution of MCR steelhead.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the United States Fish and Wildlife Service, NMFS, or both, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitat. Section 7(b)(3) requires that at the conclusion of consultation, the Service provide an opinion stating how the agencies' actions will affect listed species and their critical habitat. If incidental take is expected, section 7(b)(4) requires the consulting agency to provide an incidental take statement (ITS) that specifies the impact of any incidental taking and includes reasonable and prudent measures to minimize such impacts.

2.1 Approach to the Analysis

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to insure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The jeopardy analysis considers both survival and recovery of the species. The adverse modification analysis considers the impacts on the conservation value of designated critical habitat.

“To jeopardize the continued existence of a listed species” means to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

This opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.²

We will use the following approach to determine whether the proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- *Identify the range-wide status of the species and critical habitat likely to be adversely affected by the proposed action.* This section describes the current status of each listed species and its critical habitat relative to the conditions needed for recovery. For listed salmon and steelhead, NMFS has developed specific guidance for analyzing the status of the listed species' component populations in a “viable salmonid populations” paper (VSP; McElhany *et al.* 2000). The VSP approach considers the abundance, productivity, spatial structure, and diversity of each population as part of the overall review of a species' status. For listed salmon and steelhead, the VSP criteria therefore encompass the species' “reproduction, numbers, or distribution” (50 CFR 402.02). In describing the

² Memorandum from William T. Hogarth to Regional Administrators, Office of Protected Resources, NMFS (Application of the “Destruction or Adverse Modification” Standard Under Section 7(a)(2) of the Endangered Species Act) (November 7, 2005).

range-wide status of listed species, we rely on viability assessments and criteria in technical recovery team documents and recovery plans, where available, that describe how VSP criteria are applied to specific populations, major population groups, and species. We determine the rangewide status of critical habitat by examining the condition of its physical or biological features (also called “primary constituent elements” or PCEs in some designations) – which were identified when the critical habitat was designated. Species and critical habitat status are discussed in Section 2.2.

- *Describe the environmental baseline in the action area.* The environmental baseline includes the past and present impacts of Federal, state, or private actions and other human activities *in the action area*. It includes the anticipated impacts of proposed Federal projects that have already undergone formal or early section 7 consultation and the impacts of state or private actions that are contemporaneous with the consultation in process. The environmental baseline is discussed in Section 2.3 of this opinion.
- *Analyze the effects of the proposed action on both species and their habitat.* In this step (Section 2.4), we consider how the proposed action would affect the species’ reproduction, numbers, and distribution or, in the case of salmon and steelhead, their VSP parameters. We also evaluate the proposed action’s effects on critical habitat features.
- *Describe any cumulative effects in the action area.* Cumulative effects (Section 2.5), as defined in our implementing regulations (50 CFR 402.02), are the effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area. Future Federal actions that are unrelated to the proposed action are not considered because they require separate section 7 consultation.
- *Integrate and synthesize the above factors to assess the risk that the proposed action poses to species and critical habitat.* In this step (Section 2.6), we add the effects of the action (Section 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5) to assess whether the action could reasonably be expected to: (1) reduce appreciably the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the conservation value of designated or proposed critical habitat. These assessments are made in full consideration of the status of the species and critical habitat (Section 2.2).
- *Reach jeopardy and adverse modification conclusions.* In this step (Section 2.7) we state our conclusions regarding jeopardy and the destruction or adverse modification of critical habitat are presented in Section 2.7. These conclusions flow from the logic and rationale presented in Section 2.6 (Integration and Synthesis).
- *If necessary, define a reasonable and prudent alternative to the proposed action.* If, in completing the last step in the analysis, we determine that the action under consultation is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat, we must identify a reasonable and prudent alternative (RPA) to the action in Section 2.8. The RPA must not be likely to jeopardize the continued existence of listed species nor adversely modify their designated critical habitat and it must meet other regulatory requirements.

2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of MCR steelhead; the species that would be affected by the proposed action. The status is the level of risk that the listed species face, based on parameters

considered in documents such as recovery plans, status reviews, and listing decisions. The species status section helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential physical and biological features that help to form that conservation value.

The following describes the status of the MCR steelhead, and their designated critical habitat, and provides greater detail for the geographic area of the proposed action considered in this opinion. More detailed information on the status and trends of these listed resources, and their biology and ecology can be found in the listing regulations and critical habitat designations published in the Federal Register at 71 FR 834 and 70 FR 52630, respectively. On August 15, 2011, NMFS announced the results of a 5-year review for MCR steelhead. After considering the status of the species, ESA-listing factors, and protective measures, we determined the species should retain its threatened listing classification (76 FR 50448).

One factor affecting the status of MCR steelhead, and aquatic habitat at large is climate change. Climate change is likely to play an increasingly important role in determining the abundance of ESA-listed species, and the conservation value of designated critical habitats, in the Pacific Northwest. These changes will not be spatially homogeneous across the Pacific Northwest. Areas with elevations high enough to maintain temperatures well below freezing for most of the winter and early spring would be less affected. Low-lying areas that historically have received scant precipitation contribute little to total stream flow and are likely to be more affected.

During the last century, average regional air temperatures increased by 1.5°F, and increased up to 4°F in some areas (USGCRP 2009). Warming is likely to continue during the next century as average temperatures increase another 3 to 10°F (USGCRP 2009). Overall, about one-third of the current cold-water fish habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (USGCRP 2009).

Increased precipitation is likely to occur during October through March and less during summer and more of the winter precipitation is likely to fall as rain rather than snow (ISAB 2007, USGCRP 2009). In places like central and eastern Oregon where snow occurs, a warmer climate will cause earlier runoff resulting in stream flows in late spring, summer, and fall being lower and water temperatures being warmer (ISAB 2007, USGCRP 2009). Lower stream flows and warmer water temperatures during summer will degrade summer rearing conditions, in part by increasing the prevalence and virulence of fish diseases and parasites (USGCRP 2009).

Higher winter stream flows increase the risk that winter floods in sensitive watersheds will damage spawning redds and wash away incubating eggs (USGCRP 2009). Earlier peak stream flows will also flush some young salmon and steelhead from rivers to estuaries before they are physically mature, increasing stress and the risk of predation (USGCRP 2009). Lower stream flows and warmer water temperatures during summer will degrade summer rearing conditions, in part by increasing the prevalence and virulence of fish diseases and parasites (USGCRP 2009). Other adverse effects are likely to include altered migration patterns, accelerated embryo

development, premature emergence of fry, variation in quality and quantity of tributary rearing habitat, and increased competition and predation risk from warm-water, non-native species (ISAB 2007).

The earth's oceans are also warming, with considerable inter-annual and inter-decadal variability superimposed on the longer-term trend (Bindoff *et al.* 2007). Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances (Scheuerell and Williams 2005, Zabel *et al.* 2006, USGCRP 2009). Ocean conditions adverse to salmon and steelhead may be more likely under a warming climate (Zabel *et al.* 2006).

One of the likely effects on MCR steelhead and their associated aquatic habitat throughout the John Day River basin is ongoing and future climate change. Climate change has the potential to profoundly alter aquatic habitat. These effects would be expected to be evident as alterations of water yield, peak flows (quantity and timing), and stream temperature. Other effects, such as increased vulnerability to catastrophic wildfires, may occur as climate change alters the structure and distribution of forest and aquatic systems. Given the increasing certainty that climate change is occurring and is accelerating (IPCC 2007; Battin *et al.* 2007), we can no longer assume that climate conditions in the future will resemble those in the past.

There is still a great deal of uncertainty associated with likely changes in timing, location and magnitude of future climate change, and what that means for the John Day watershed. It is also likely that the intensity of effects will vary by region (ISAB 2007). However, several studies have revealed that climate change has the potential to affect ecosystems in nearly all tributaries throughout Oregon (ISAB 2007, Battin *et al.* 2007; Rieman *et al.* 2007).

2.2.1 Status of Listed Species

When NMFS began recovery planning for salmon and steelhead in the Interior Columbia Basin, we convened a technical recovery team (IC-TRT) comprised of Federal, state, and tribal biologists as well as scientists from private consulting firms and academia. This team assisted NMFS in developing information on historical population structure and also produced ESA technical products to support development of ESA recovery criteria. As part of this effort, the IC-TRT identified independent populations for each Interior Columbia Basin ESA-listed species, and grouped them together into genetically similar major population groups (MPGs). Most evolutionarily significant units (ESUs) and distinct population segments (DPSs) are made up of several MPGs.

For species with multiple populations, once the biological status of a species' populations has been determined, NMFS assesses the status of the entire species using criteria for groups of populations, as described in recovery plans and guidance documents from technical recovery teams. Considerations for species viability include having multiple populations that are viable, ensuring that populations with unique life histories and phenotypes are viable, and that some viable populations are both widespread to avoid concurrent extinctions from mass catastrophes and spatially close to allow functioning as meta-populations (McElhany *et al.* 2000).

The IC-TRT also recommended population-specific biological viability criteria for each of the individual populations for each ESU and DPS. These criteria are integrated to develop a total population viability rating. The population viability ratings, in order of increasing risk, are highly viable, viable, moderate risk and high risk. A further bifurcation occurs at the moderate risk rating. Populations rated at moderate risk are candidates for achieving a “maintained” status. Additional criteria to be identified in the Recovery Plan must be met before a population at moderate risk can be considered “maintained.” Populations that do not meet these additional criteria would remain rated at moderate risk and would generally not contribute to viability at the MPG level.

Climate change, as described in Section 2.2, is likely to adversely affect the size and distribution of populations of ESA-listed anadromous fish in the Pacific Northwest. The size and distribution of the populations considered in this opinion generally have declined over the past few decades due to natural phenomena and human activity, including the operation of hydropower systems, over-harvest, hatcheries, and habitat degradation. Enlarged populations of terns, seals, sea lions, and other aquatic predators in the Pacific Northwest have been identified as factors that may be limiting the productivity of some Pacific salmon and steelhead populations (Ford 2011).

For Pacific salmon and steelhead, NMFS commonly uses four parameters to assess the viability of the populations that, together, constitute the species: spatial structure, diversity, abundance, and productivity (McElhany *et al.* 2000). As discussed above, these “viable salmonid population” (VSP) criteria encompass the species’ “reproduction, numbers, or distribution” as described in 50 CFR 402.02. When these parameters are collectively at appropriate levels, they maintain a population’s capacity to adapt to various environmental conditions and allow it to sustain itself in the natural environment. These attributes are influenced by survival, behavior, and experiences throughout a species’ entire life cycle, and these characteristics, in turn, are influenced by habitat and other environmental conditions.

Spatial Structure and Diversity. “Spatial structure” refers both to the spatial distributions of individuals in the population and the processes that generate that distribution. A population’s spatial structure depends fundamentally on habitat quality and spatial configuration and the dynamics and dispersal characteristics of individuals in the population.

“Diversity” refers to the distribution of traits within and among populations. These range in scale from DNA sequence variation at single genes to complex life history traits (McElhany *et al.* 2000).

Abundance and Productivity. “Abundance” generally refers to the number of naturally-produced adults (*i.e.*, the progeny of naturally-spawning parents) in the natural environment (*e.g.*, on spawning grounds).

“Productivity,” as applied to viability factors, refers to the entire life cycle; *i.e.*, the number of naturally-spawning adults produced per parent. When progeny replace or exceed the number of parents, a population is stable or increasing. When progeny fail to replace the number of parents, the population is declining. McElhany *et al.* (2000) use the terms “population growth rate” and

“productivity” interchangeably when referring to production over the entire life cycle. They also refer to “trend in abundance,” which is the manifestation of long-term population growth rate.

MCR steelhead. Steelhead typically migrate to marine waters after spending two years in fresh water. They reside in marine waters for two or three years prior to returning to natal streams to spawn as 4- or 5- year-olds. Steelhead adults typically spawn between December and June. Depending on water temperature, steelhead eggs may incubate in redds for 1.5 to four months before hatching as alevins. Following yolk sac absorption, young juveniles emerge from the gravel and begin actively feeding. Juveniles rear in fresh water from one to four years, and then migrate to the ocean as “smolts.”

This species includes all naturally-spawned steelhead populations below natural and artificial impassable barriers in streams from above the Wind River, Washington, and the Hood River, Oregon (exclusive), upstream to, and including, the Yakima River, Washington, excluding steelhead from the Snake River basin; and progeny of seven artificial propagation programs (71 FR 834; January 5, 2006). On August 15, 2011, NMFS announced the results of an ESA 5-year review for MCR steelhead (76 FR 50448). After reviewing new information on the viability of this species, ESA section 4 listing factors, and efforts being made to protect the species, NMFS concluded that this DPS should retain its threatened listing classification.

The IC-TRT identified 17 extant populations in this DPS (IC-TRT 2003). The populations fall into four major population groups: the Yakima River basin (four extant populations), the Umatilla/Walla-Walla drainages [three extant and one extirpated (Willow Creek) populations]; the John Day River drainage (five extant populations) and the Eastern Cascades group (five extant and two extirpated populations) (NMFS 2009, Ford 2011). The John Day River (JDR) has the largest naturally spawning, native stock of steelhead in the region.

The ICTRT’s DPS-level viability criterion is that all extant MPGs should be at low risk (ICTRT 2007, NMFS 2009). The majority of natural Middle Columbia steelhead populations are rated at “moderate risk” for all four viable salmonid population (VSP) parameters – abundance, productivity, spatial structure, and diversity. Thus, the Middle Columbia steelhead DPS does not currently meet viability criteria based on the determination that the four component MPGs are not at “low” risk (NMFS 2009).

The current status of the John Day River MPG populations, showing 10-year geometric mean abundance by population, estimated productivity, and the minimum abundance threshold needed for long-term viability is summarized in Table 5. The table also includes the 10-year geometric mean proportion of hatchery spawners for the populations where data are available, and the risk ratings of high, moderate, low, and very low, for abundance and productivity combined, and spatial structure and diversity combined.

Table 5. MCR Steelhead John Day River MPG - Summary of abundance, productivity, risk ratings, and minimum abundance thresholds (NMFS 2009).

Population	Abundance Threshold ¹	Size Category	Run Timing	10-year Geomean abundance	Abundance Range	10-yr Hatchery Fraction ²	Productivity ³	Productivity Standard Error	A&P Risk Rating ⁴	SSD Risk Rating
Lower Mainstem John Day	2250	Very Large	Summer	1800	563-6257	0.1	2.99	0.24	M	M
North Fork John Day	1500	Large	Summer	1740	369-10,235	0.08	2.41	0.22	VL	L
Upper Mainstem John Day	1000	Intermediate	Summer	524	185-5169	0.08	2.14	0.33	M	M
Middle Fork John Day	1000	Intermediate	Summer	756	195-3538	0.08	2.45	0.16	M	M
South Fork John Day	500	Basic	Summer	259	76-2729	0.08	2.06	0.27	M	M

¹ Abundance threshold for viability based on habitat intrinsic potential

² Average proportion of hatchery spawners over most recent 10 years in the data series.

³ Geomean return per spawner calculated over most recent 20 years in data series.

⁴ Abundance & Productivity Risk Ratings: H = high risk, M= moderate risk, L = low risk, VL = very low risk

Currently, the John Day MPG is not viable (NMFS 2009). In order to be considered viable, the John Day MPG must meet the following criteria: (1) Three of the five historical populations (Upper, Middle Fork, North Fork, Lower, and South Fork) must meet IC-TRT viability criteria; (2) viable populations within the John Day MPG must include two populations classified as “large” or “very large” (only the Lower and North Fork populations satisfy this criterion, so they are both required to be viable) and one intermediate size; (3) all major life history strategies must be present; (4) one of the populations must be “highly viable” (the North Fork population currently satisfies this criterion); and (5) all populations that do not meet viable status must be maintained (as defined by IC-TRT 2007) (NMFS 2009). For the John Day MPG to reach viable status, the Lower Mainstem John Day River, North Fork John Day River (NFJD), and either the Middle Fork John Day (MFJD) or Upper John Day River (UJDR) populations should achieve viable status, with one achieving “highly viable” status. The remaining South Fork John Day (SFJD) population must achieve a maintained status.

According to the most recent status review (Ford 2011), the only two populations ranked at the desired status for recovery are: the NFJD population which is considered highly viable, and the SFJD population, which is rated currently at a maintained status. The other three populations are ranked at a maintained status. The MPG-level recovery criteria call for the Lower John Day population to reach a viable status and either the MFJD or the UJDR to reach viable status (Ford 2011, NMFS 2009). Figure 4 shows the current viability status of the five populations making up the John Day MPG.

		Spatial Structure / Diversity Risk			
		V. Low	Low	Mod.	High
Abundance / Productivity Risk	V. Low		JD North Fk		
	Low				
	Mod.		JD Middle Fk JD South Fk	JD Lower MS JD Upper MS	
	High				

John Day River Major Population Group

Figure 4. Viability ratings for the John Day MPG (NMFS 2009). Shades of green indicate lower risk and shades of orange to red indicate higher risk of extinction in 100 years.

Limiting Factors. The factors limiting recovery as stated in the Middle Columbia River Steelhead Recovery Plan (NMFS 2009) for the John Day River MPG are as follows:

- (1) Mainstem passage, (2) hatchery related effects, (3) tributary habitat, and
- (4) predation/competition/disease.

Mainstem passage. These populations must pass three dams; thus limiting factors include direct mortality of pre-smolts and smolts at John Day, The Dalles, and Bonneville dams; delayed upstream migration of returning adults; false attraction of returning adults over McNary Dam; and cumulative impact of hydropower system on mainstem and estuary habitat.

Hatchery-related effects. Concern over competition for resources with wild fish and potential hybridization with natural-origin fish resulted in termination of all hatchery stocking of *O. mykiss* in the John Day River basin in 1997. However, hatchery strays, primarily from the Snake River, have been observed in all John Day populations, particularly in the lower John Day mainstem. Hatchery fish straying into natural spawning areas pose risks to genetic traits and productivity of naturally produced steelhead.

Tributary habitat. For all five John Day populations, degraded floodplain and degraded channel structure (key habitat quantity and habitat diversity), altered sediment routing, water quality (high temperatures), and altered hydrology are limiting factors. For the Lower and Upper

Mainstem and South Fork populations, passage obstructions in some of the smaller tributaries are also significant.

Predation/competition/disease. Predation, competition, and disease issues in mainstem and estuary can affect all of the MCR steelhead populations.

The MCR Steelhead Recovery Plan (NMFS 2009) identified population limiting factors. For the NFJD population, the primary tributary habitat limiting factors are degraded floodplain connectivity and function, degraded channel structure and complexity (key habitat quantity, habitat diversity, and channel stability), altered sediment routing, water quality (temperature), and altered hydrology. For the MFJD population they are degraded floodplain and channel structure (key habitat quantity/diversity), altered sediment routing, altered hydrology and water temperature. The primary tributary habitat limiting factors for the SFJD population include altered sediment routing, degraded floodplain and channel structure (key habitat quantity and habitat diversity), altered hydrology, water quality (temperature) and blocked or impaired fish passage. Limiting factors for the UJDR population include degraded floodplain and channel structure (key habitat quantity and habitat diversity), altered sediment routing, water quality (temperature) and altered hydrology. Impaired fish passage is also a priority limiting factor for Beech and Laycock creeks.

The action area is primarily associated with the SFJD population that contains three Major Spawning Areas: Upper SFJD; Murderers Creek; and Lower SFJD. Tributary habitat limiting factors identified in NMFS (2009) for the SFJD River population and the adjacent UJDR population, and for specific streams within the action area, are displayed in Table 6.

Table 6. MCR Steelhead habitat limiting factors identified in NMFS (2009) for the Upper South Fork John Day River and the Upper Mainstem John Day River Populations, and streams within the ESA action area.

Limiting Factor	South Fork JDR Population	Upper Mainstem JDR Population	Upper, Middle and South Fork Murderers Creek	Lower Murderers Creek	Deer Creek	Fields Creek
Degraded floodplain connectivity and function	X	X	X	X	X	X
Degraded channel structure and complexity	X	X	X	X		X
Altered hydrology	X	X	X			X
Altered sediment routing	X	X	X	X	X	X
Water temperature	X	X		X	X	X
Degraded riparian communities	X	X	X	X	X	
Man-made block to migration	X					
Impaired fish passage	X	X				X

2.2.2 Status of Critical Habitat

We review the status of designated critical habitat affected by the proposed action by examining the condition and trends of essential physical and biological features throughout the designated area. These features are essential to the conservation of the listed species because they support one or more of the species' life stages (*e.g.*, sites with conditions that support spawning, rearing, migration and foraging).

For salmon and steelhead, NMFS ranked watersheds within designated critical habitat at the scale of the fifth-field hydrologic unit code (HUC5) in terms of the conservation value they provide to each listed species they support,³ the conservation rankings are high, medium, or low.

³ The conservation value of a site depends upon “(1) the importance of the populations associated with a site to the ESU [or DPS] conservation, and (2) the contribution of that site to the conservation of the population through demonstrated or potential productivity of the area” (NOAA Fisheries 2005).

To determine the conservation value of each watershed to species viability, NMFS' critical habitat analytical review teams (CHARTs; NOAA Fisheries 2005) evaluated the quantity and quality of habitat features (for example, spawning gravels, wood and water condition, side channels), the relationship of the area compared to other areas within the species' range, and the significance to the species of the population occupying that area. Thus, even a location that has poor quality of habitat could be ranked with a high conservation value if it were essential due to factors such as limited availability (*e.g.*, one of a very few spawning areas), a unique contribution of the population it served (*e.g.*, a population at the extreme end of geographic distribution), or the fact that it serves another important role (*e.g.*, obligate area for migration to upstream spawning areas).

Climate change, as described in Section 2.2, is likely to reduce the quantity and quality of habitat features of designated critical habitats in the Pacific Northwest.

Status of Critical Habitat in the Interior Columbia Basin. Critical habitat has been designated in the Interior Columbia Basin for MCR steelhead. Major tributary river basins in the Interior Columbia basin include the Klickitat, Deschutes, Yakima, John Day, Umatilla, and Walla Walla rivers.

Migratory habitat quality in this area has been impacted by the development and operation of the Federal Columbia River Power System dams in the mainstem Columbia River and privately owned dams in the Snake and Upper Columbia River basins. Hydroelectric development has modified natural flow regimes, resulting in higher water temperatures, changes in fish community structure leading to increased rates of piscivorous and avian predation on juvenile salmonids, and delayed migration time for both adult and juvenile salmonids. Physical features of dams such as turbines also kill migrating fish. In-river survival is inversely related to the number of hydropower projects encountered by emigrating juveniles.

In addition to the development and operation of the dams in the mainstem rivers, development and operation of irrigation systems and hydroelectric dams for water withdrawal and storage in tributaries have altered hydrological cycles, causing a variety of adverse impacts to salmon and steelhead spawning and rearing habitat. Condit Dam on the White Salmon River has extirpated a population of MCR steelhead from the Cascades Eastern Slope MPG (this dam was recently removed). In the Umatilla River subbasin, the Bureau of Reclamation developed the Umatilla Project in 1906, effectively eliminating over 108 miles of historically highly productive tributary habitat for MCR steelhead in upper McKay Creek due to construction of the McKay Dam and Reservoir in 1927.

Habitat quality in tributary streams in the Interior Columbia basin varies from excellent in wilderness and roadless areas to poor in areas subject to heavy agricultural and urban development (Overton *et al.* 1995; Wissmar *et al.* 1994; and McIntosh *et al.* 1994). Lack of summer stream flows, impaired water quality, and reduction of habitat complexity are common problems for critical habitat in developed areas. Critical habitat throughout the Interior Columbia River basin has been degraded by several management activities, including agriculture, alteration of stream morphology (*i.e.*, channel modifications and diking), riparian vegetation disturbance, wetland draining and conversion, livestock grazing, dredging, road construction and

maintenance, timber harvest, mining, and urbanization (Lee *et al.* 1997). Changes in habitat quantity, availability, diversity, flow, temperature, sediment load, and channel instability are common symptoms of ecosystem decline in areas of critical habitat. Large-scale habitat assessments in the Interior Columbia basin indicate that in-watersheds managed for natural resources extraction, the number of large pools has decreased from 20 to 87% (McIntosh *et al.* 1994).

Areas where habitat is still largely functioning appropriately include the South Fork Walla Walla, portions of the Deschutes Basin, and portions of the North Fork John Day River. Most of these areas are in designated wilderness or roadless areas.

Many stream reaches designated as critical habitat in the Interior Columbia basin are over allocated under state water law, with more allocated water rights than existing stream flow conditions can support. Irrigated agriculture is common throughout this region and withdrawal of water increases summer stream temperatures, blocks fish migration, strands fish, and alters sediment transport (Spence *et al.* 1996). Continued operation and maintenance of large water reclamation systems such as the Umatilla Basin and Yakima Projects have disrupted riverine ecosystems

MCR steelhead critical habitat. On September 2, 2005, NMFS published a final rule (70 FR 52630) to designate critical habitat for MCR steelhead. Critical habitat has been designated for populations of MCR steelhead in the Upper John Day River, the Lower John Day River, and the North, South, and Middle Forks of the John Day River. The Middle Fork, North Fork and Upper John Day subbasins provide freshwater spawning, rearing, and migration primary constituent elements (PCEs) for MCR steelhead (Table 7).

The John Day River basin is wholly within Oregon. The John Day River, which flows west from the Blue Mountains and then north through a deeply carved, basaltic landscape, is the second longest free-flowing river in the continental United States. The towns within the subbasin with the largest populations are John Day, Prairie City, and Condon, all with less than 2,000 residents. The largest tributary to the John Day River is the North Fork John Day, which originates in the Wallowa-Whitman National Forest in the Blue Mountains at elevations near 8,000 feet. The North Fork John Day River flows westerly for 112 miles and joins the mainstem near Kimberly (RM 185), 15 miles below the town of Monument. The John Day basin drainage area includes over five million acres, or 8000 square miles, and is divided into four major watersheds: Lower John Day River, Upper John Day River, Middle Fork John Day River and North Fork John Day River.

Table 7. PCEs of critical habitat designated for ESA-listed MCR steelhead considered in this Opinion and corresponding species life history events.

Primary Constituent Elements		Species Life History Event
Site Type	Site Attribute	
Freshwater spawning	Substrate Water quality Water quantity	Adult spawning Embryo incubation Alevin growth and development
Freshwater rearing	Floodplain connectivity Forage Natural cover Water quality Water quantity	Fry emergence from gravel Fry/parr/smolt growth and development
Freshwater migration	Free of artificial obstruction Natural cover Water quality Water quantity	Adult sexual maturation Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration

Changes in habitat quantity, availability and diversity, flow, temperature, sediment load, and channel instability are common symptoms of ecosystem decline in areas of critical habitat for MCR steelhead. Many streams in critical habitat areas for this species are listed as water-quality limited on the Oregon Department of Environmental Quality's (ODEQ) section 303(d) Clean Water Act (CWA) list for parameters such as water temperatures, dissolved oxygen, or biological criteria (ODEQ 2006). Additionally, the ODEQ identified total phosphates and fecal coliform as water quality limitations for many streams within the Lower Mainstem John Day River, and sediment for many North Fork John Day streams (NMFS 2004). Contaminants such as insecticides and herbicides from agricultural runoff and heavy metals from mine waste are common in some areas of critical habitat for MCR steelhead. The following watersheds are within the action area for the proposed action:

Upper John Day - Middle South Fork John Day River (1707020102). The CHART report indicates that the Middle South Fork John Day River watershed contains 24.3 miles of the spawning/rearing PCE. The CHART report rates the Middle South Fork John Day River as having a high conservation value. The John Day River Subbasin Plan (Northwest Power and Conservation Council [NPCC] 2005) identified the following limiting factors in the Middle South Fork John Day River: channel stability, flow, habitat diversity, obstructions, sediment load, temperature, key habitat quantity, and withdrawals.

Upper John Day – Murderers Creek (1707020103). The CHART report indicates that the Murderers Creek watershed contains 52.4 miles of the spawning/rearing PCE and 15.6 miles of the migration/presence PCE. The CHART report rates Murderers Creek as having a high conservation value. The John Day River Subbasin Plan (NPCC 2005) identified the following limiting factors in the Murderers Creek: channel stability, flow, habitat diversity, obstructions, sediment load, temperature, and key habitat quantity.

Upper John Day - Lower South Fork John Day River (1707020104). The CHART report indicates that the Lower South Fork John Day River watershed contains 79.3 miles of the spawning/rearing PCE. The CHART report rates the Lower South Fork John Day River as having a high conservation value. The John Day River Subbasin Plan (NPCC 2005) identified the following limiting factors in the Lower South Fork John Day River: predation, flow, habitat diversity, obstructions, sediment load, temperature, and key habitat quantity.

Figure 5 is a map from the CHART report that displays designated critical habitat for the Upper John Day River subbasin containing the aforementioned subwatersheds.

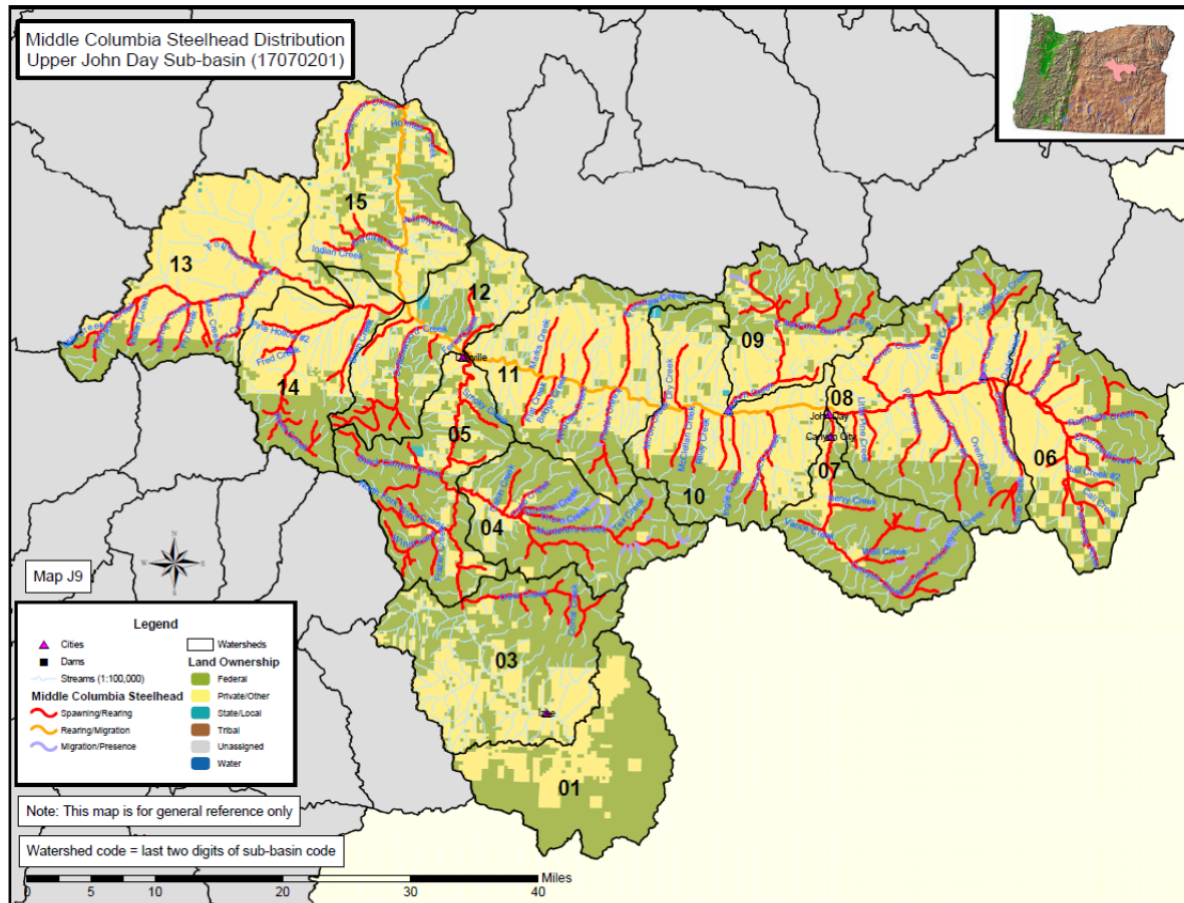


Figure 5. Upper John Day River Critical Habitat. (NMFS 2004)

2.3 Environmental Baseline

The “environmental baseline” includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

MCR steelhead within the Murderers Creek wild horse Territory are part of the SFJD population. The Territory is located within the Upper John Day River subbasin (HUC # 17070201) and is comprised primarily of the Murderers Creek (HUC #1707020103), Middle South Fork John Day River (HUC #1707020102), and Lower South Fork John Day River (HUC #1707020104) watersheds. Figure 6 shows the juxtaposition of these watersheds within the subbasin. The Territory includes approximately 143,000 acres of Federal (MNF and PD), State (PWSWA) and private lands, of which approximately 75% is on the MNF. Activities that have occurred or continue to occur within these watersheds include mining, timber harvest, grazing, roads, trails, prescribed and natural fire, noxious weed treatment, recreational activities (camping, hunting, fishing, etc.) and various forms of motorized and non-motorized recreation.

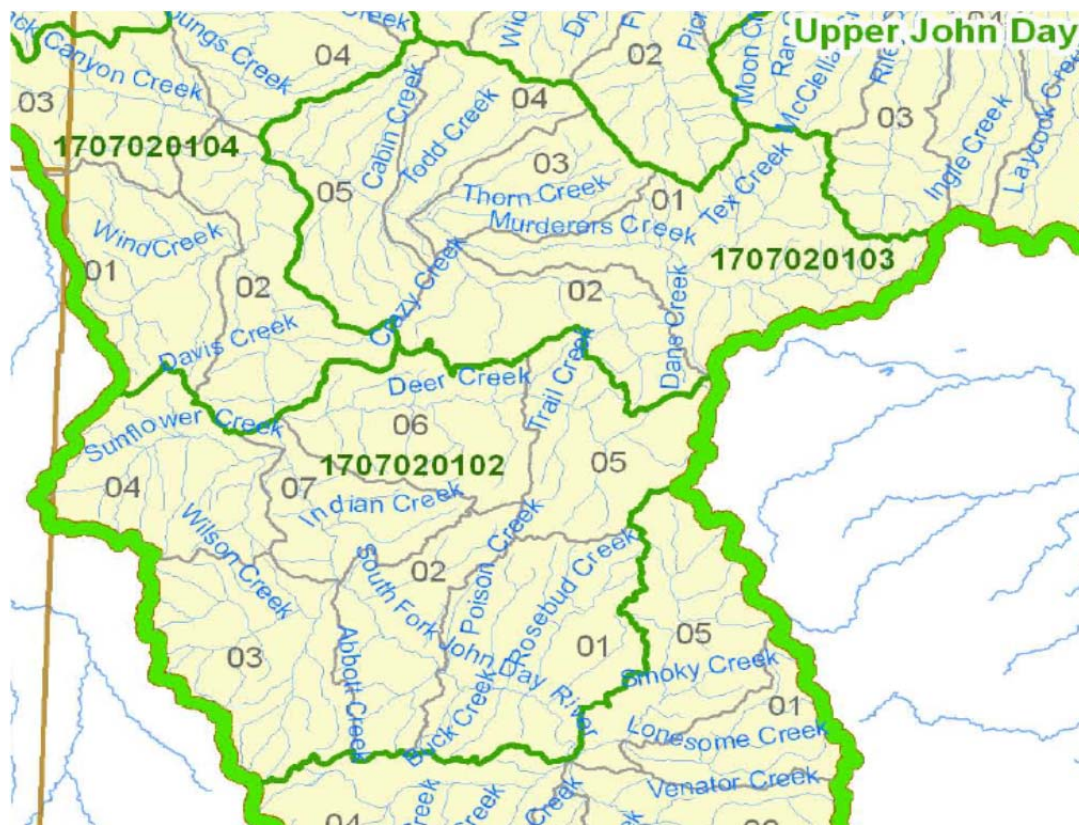


Figure 6. Upper John Day Subbasin 5-field HUC watersheds within Territory: Murderers Creek (HUC #1707020103), Middle SFJDR (HUC #1707020102), and Lower SFJDR (HUC #1707020104).

Elevations within the Territory range from approximately 3,250 feet at the western boundary to 6,987 feet-elevation Aldrich Mountain. Climate is characterized by hot, dry summers and cold winters with temperatures ranging from below zero in the winter to 90+°F in the summer. Average annual precipitation ranges from 11.5 inches in the lower elevations to about 30 inches along Aldrich Ridge. Most precipitation occurs as snowfall between November and April. Water is easily accessible by horses throughout the Territory all year long via the dozens of streams and

ivers as well as the several hundred troughs, springs, and ponds maintained by the grazing permittees to provide off-stream watering capability.

The MCR Steelhead Recovery Plan (NMFS 2009 and ODFW 2009) describes the primary tributary habitat limiting factors for the South Fork John Day River Population as altered sediment routing, degraded floodplain and channel structure, altered hydrology, water temperature, and blocked or impaired fish passage. The ODFW (2009) considers Murderers Creek downstream from Cabin Creek as not properly functioning for floodplain connectivity and function. Within the recovery plan, ODFW (2009) considers the lower tributaries of Murderers Creek draining the south side of Aldrich Mountain to be one of the highest priority areas for protecting and conserving natural ecological processes. Additionally, ODFW (2009) identifies the South Fork Murderers Creek as a high priority for restoring riparian condition, floodplain connectivity, properly functioning stream channel structure and complexity, as well as restoring the natural hydrograph to provide sufficient flows during critical periods for MCR steelhead,

The MNF (MNF *et al.* 1997) and ODFW (2009) reported that loss of beavers, active LWD removal projects, road construction, riparian timber harvests and grazing management have accelerated water runoff and instream velocities in the South Fork John Day River system, which led to increased stream channel and bank erosion and incised and unstable channels. However, recent stream bank surveys indicated that the lower 14.6 miles of Murderers Creek, protected by riparian fences, had banks that ranged from 98 to 100 percent stable (ODFW 2009). Lack of large woody debris (LWD) in lower Murderers Creek remains a concern, although it is expected to improve as riparian vegetation recovers in the fenced areas. Stream types within upper Murderers Creek generally may not support side channels, and those present are dewatered as flows drop in the summer. Water temperatures and unsuitable habitat associated with naturally occurring low water conditions in Murderers Creek likely alter or temporarily block movement of juveniles during summer months (ODFW 2009). ODFW (2009) states that pool numbers are closer to bench mark values in the South Fork than in the tributaries likely due to increased beaver activity since the 1960s which helps improve water storage capacity of the system.

A NMFS process paper titled “Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale” (NMFS 1996) may be used to describe the environmental baseline. It is commonly known as the NMFS Matrix of Pathways and Indicators, hereafter referenced as the “NMFS MPI.” The NMFS MPI identifies indicators to analyze for the following pathways: 1) Water quality; 2) Habitat access; 3) Habitat elements; 4) Channel condition and dynamics; 5) Flow/hydrology; and, 6) Watershed condition. The condition of each indicator is described as either “Properly Functioning” (PF), “At Risk (AR),” or “Not Properly Functioning (NPF)” based upon specific numeric or qualitative criteria. Table 7 presents information provided in the BA on the current status of the environmental baseline for the Upper John Day River sub-basin, which includes the action area, utilizing the NMFS MPI. Table cells in bold print indicate the current status of each indicator. The habitat indicators in the NMFS MPI also correspond to the PCEs of designated CH. The relationship between NMFS MPI habitat indicators and PCEs of critical habitat is discussed in Section 7.2 of the BA (Analysis of Effects to Designated Critical Habitat).

Impacts from the legacy road system on Forest Service lands in the SFJD River have affected

baseline conditions for several MPI indicators: sediment; substrate; road density and location; floodplain connectivity; increase in drainage network and physical barriers. Each has received an MPI rating of NPF in Table 7. The Recovery Plan (NMFS 2009) cites the MNF (1997) when stating that roads might be the single most important threat causing increases in stream sedimentation because of density, location, and maintenance. The Recovery Plan describes areas with high road densities and stream reaches contributing excessive sediment to stream channels:

Road densities on Forest Service lands in various HUC5s of the South Fork drainage are: 2.75 miles/mile² in Murderers Creek; 4.14 miles/mile² in Deer Creek; 4.25 miles/mile² in Middle South Fork; and 3.27 miles/mile² in Upper South Fork. The most heavily roaded areas are coincident with sedimentary soils in the upper watershed (MNF 1997). Surveys from 1992 to 1997 identified a number of reaches in the Murderers Creek watershed that were contributing excessive sediment to stream channels including, Beaver and North Fork Beaver, Miner, Grapefruit, Orange, Charley Mack, South Fork Murderers, Bark Cabin, Murderers (reach between Stewart's Cabin and Murderers Creek Guard Station), Oregon Mine, and Tennessee creeks.

The characterization of the environmental baseline using the NMFS MPI ratings, presented in Table 8, was presented in the BA and is based upon scientific literature review, management documents and the professional judgment of MNF staff. The BA also states that the MCR Steelhead Recovery Plan (NMFS 2009), MNF roads analyses, and MNF water temperature monitoring information support the environmental baseline ratings of AR and NPF for several NMFS MPI indicators.

Table 8. Status of environmental baseline for the Upper John Day sub-basin.¹

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
Water Quality	Temperature	50 – 57° F (max 7-day average)	57 – 61° F (spawning, max 7-day average) 57 – 64° F (migration and rearing, max 7-day average)	> 61° F (spawning, max 7-day average) > 64° F (migration and rearing, max 7-day average)
	Sediment	< 12% fines (<0.85mm) in gravel	12 – 20% fines	> 20% fines
	Chemical Contaminants or Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients; no CWA 303d designated reaches	Moderate levels of chemical contamination from agricultural, industrial, and other sources; some excess nutrients; one CWA 303d designated reach	High levels of chemical contamination from agricultural, industrial, and other sources; high levels of excess nutrients; more than one CWA 303d designated reach
Habitat Access	Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows	Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at base/low flows	Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at a range of flows
Habitat Elements	Substrate	Dominant substrate is gravel or cobble (interstitial spaces clear), or embeddedness <20%	Gravel and cobble is subdominant, or if dominant, embeddedness 20 – 30%	Bedrock, sand, silt, or small gravel dominant, or if gravel and cobble dominant, embeddedness >30%
	Large Woody Debris	> 20 pieces/mile (> 12 inch diameter and > 35 ft. length), and adequate sources of woody debris recruitment in riparian areas	Currently meets standards for Properly Functioning, but lacks potential sources from riparian areas of woody debris recruitment to maintain that standard	Does not meet standards for Properly Functioning and lacks potential large woody debris recruitment
	Pool Frequency	Meets pool frequency standards and meets large woody debris recruitment standards for Properly Functioning habitat	Meets pool frequency standards but large woody debris recruitment inadequate to maintain pools over time	Does not meet pool frequency standards

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
	Pool Quality	Pools > 1 meter deep (holding pools) with good cover and cool water; minor reduction of pool volume by fine sediment	Few deeper pools (> 1 meter) present or inadequate cover/temperature; moderate reduction of pool volume by fine sediment	No deep pools (> 1 meter) and inadequate cover/temperature; major reduction of pool volume by fine sediment
	Off Channel Habitat	Backwaters with cover, and low energy off-channel areas (ponds, oxbows, etc.)	Some backwaters and high energy side channels	Few or no backwaters; no off-channel ponds
	Refugia	Habitat refugia exist and are adequately buffered (<i>e.g.</i> , by intact riparian reserves); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or subpopulations (all life stages and forms)	Habitat refugia exist but are not adequately buffered (<i>e.g.</i> , by intact riparian reserves); existing refugia are insufficient in size, number, and connectivity to maintain viable populations or subpopulations (all life stages and forms)	Adequate habitat refugia do not exist
Channel Condition & Dynamics	Width/Depth Ratio	< 10	10 – 12	> 12
	Stream Bank Condition	> 80% of any stream reach has > 90% stability	50 – 80% of any stream reach has > 90% stability	< 50% of any stream reach has > 90% stability
	Floodplain Connectivity	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland functions, riparian vegetation, and succession	Reduced linkage of wetland, floodplains, and river areas to main channel; overbank flows are reduced relative to historic frequency, as evidenced by moderate degradation of wetland function and riparian vegetation/succession	Severe reduction in hydrologic connectivity between off-channel, wetland, floodplain, and riparian areas; wetland extent drastically reduced, and riparian vegetation/success altered significantly
Flow/Hydrology	Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of similar size, geology, and geography	Some evidence of altered peak flow, base flow, and/or flow timing relative to an undisturbed watershed of similar size, geology, and geography	Pronounced changes in peak flow, base flow, and/or timing relative to an undisturbed watershed of similar size, geology, and geography
	Increase in Drainage Network	Zero or minimum increases in drainage network density due to roads	Moderate increases in drainage network density due to roads (<i>e.g.</i> , 5%)	Significant increases in drainage network density due to roads (<i>e.g.</i>, 20 – 25%)
Watershed Condition	Road Density & Location	< 2 mi/mi ² ; no valley bottom roads	2 – 3 mi/mi ² ; some valley bottom roads	> 3 mi/mi²; many valley bottom roads

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
	Disturbance History	< 15% ECA (entire watershed) with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or riparian areas	< 15% ECA (entire watershed) but disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian areas	> 15% ECA (entire watershed) and disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian areas
	Riparian Management Areas	The riparian reserve system provides adequate shade, large woody debris recruitment, and habitat protection and connectivity in all subwatersheds, and buffers or includes known refugia for sensitive aquatic species (>80% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition > 50%	Moderate loss of connectivity or function (shade, LWD recruitment, etc.) of riparian reserve system, or incomplete protection of habitats and refugia for sensitive aquatic species (~ 70 – 80% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition 25 – 50% or better	Riparian reserve system is fragmented, poorly connected, or provides inadequate protection of habitats and refugia for sensitive aquatic species (< 70% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition < 25%

¹**Bold text** in cells indicates current status of the indicator.

Altered sediment routing is a concern in the SFJDR. Greater than 50% embeddedness of substrate particles was reported in 21 of 26 summaries for streams in the South Fork watershed (MNF 2004). Substrate embeddedness greater than 30 percent results in a “NPF” classification under the NMFS MPI.

Changes in peak and base flows have resulted from land use practices, historic stream channelization and summer irrigation withdrawals (NMFS 2009). Lack of flow limits the use of some potential spawning areas in Murderers Creek and other SFJD tributaries, and may block seasonal migration of steelhead juveniles in the summer due to temperature barriers. Loss of beavers, for example in John Young Meadows in Murderers Creek, has resulted in loss of water storage capacity.

The Recovery Plan states that high summer water temperatures are considered a major limiting factor for the area. Dan’s Creek, Deer Creek, North Fork Deer Creek, Murderers Creek, South Fork John Day River and Tex Creek are on the ODEQ 303(d) list for water temperature (ODEQ 2010). Data from a stream gage near the mouth of Murderers Creek showed that water temperatures exceeded 64°F 54% of the time between July 1 and September 30, averaged over a 5-year period (ODFW 2005).

Riparian vegetation has also been altered from its historic condition by grazing, water diversion and channelization according to the Recovery Plan. Instream LWD accumulations and the potential for future LWD have also been reduced. Of 28 streams in the SFJDR reported by the MNF in 2004, 15 streams met the NMFS MPI criteria of >20 pieces per mile of LWD >35 feet in length.

Additional information, considered in this opinion, informing the condition of the environmental baseline at finer scales than the Upper John Day sub-basin include water temperature monitoring information, PACFISH-INFISH Biological Opinion (PIBO) effectiveness monitoring results, annual end-of-year grazing reports for the years 2008-2011 (MNF 2009b, MNF 2009c and MNF 2011a), Proper Functioning Condition (PFC) assessments (Prichard *et al.* 1994) and Multiple Indicator Monitoring (MIM) (Burton *et al.* 2011) results at Designated Monitoring Areas (DMA) for specific pastures in the Murderers Creek Allotment for years ranging from 2004 to 2011.

Additionally, as a part of the 2012-2016 livestock grazing program, MNF identified stream sections and designated them “most sensitive riparian areas” (MSRA) where stream channel and habitat conditions are particularly well suited for MCR steelhead spawning. In addition to pre-turnout spawning surveys on 20% of the MCR steelhead critical habitat in each allotment, the MNF monitoring strategy added spawning surveys at 100% of MSRA areas that have livestock access. When surveys locate spawners or redds, management measures are implemented to protect the redds.

The MNF and PD provided relevant environmental baseline information derived from the separate ESA consultation efforts on their livestock grazing programs (MNF 2011b and USDI-BLM 2010). The grazing allotments overlapping with the Territory are displayed in Figure 7, and will be discussed below.

On MNF lands, the designated Territory includes all of the Murderers Creek and Rosebud allotments, as well as part of the Snowshoe Allotment (Tamarack pasture). Both Rosebud and Snowshoe Allotments are outside the current distribution of MCR steelhead. On PD land, the Territory includes the following livestock grazing allotments: Big Baldy 4052, Big Flats 4186, Murderers Creek 4020, Rockpile 4403, Soda Creek 4044, Morgan Creek 4154, Mahogany 4043, Corral Gulch 4164 and Cow Creek 4352. Within the MNF, MCR steelhead designated critical habitat is identified in the Murderers Creek allotment. The southern portions of Aldrich and Fields Peak allotments, which abut the northern boundary of the Territory, also include MCR critical habitat, and because of the occasional use by wild horses in those portions of Murderers Creek drainage contained within these allotments, are incorporated into the ‘Action Area’ (see Section 1.4). PD allotments within the Territory having designated MCR steelhead critical habitat include; Big Baldy 4052, Murderers Creek 4020, Rockpile 4403, and Corral Gulch 4164 (fenced off from livestock), with the remaining five allotments located outside the range of MCR steelhead (see Figure 6).

Further general descriptions of vegetation and landscape features of lands making up the Territory that overlap with MCR steelhead distribution and designated critical habitat were included in the BA (MNF lands), and in the May 25, 2012 memo which provided additional environmental baseline information for PD.

The BA described the 51,927-acre PWSWA, which is within the Territory, as containing approximately 37 miles of steelhead critical habitat along the mainstem South Fork John Day River and tributaries, primarily Deer Creek, Cougar Gulch, and lower Murderers Creek. The PWSWA has 20 fenced pastures where alternate-use livestock grazing is used to remove senesced grass stems and leaves to improve plant vigor, thereby increasing nutritive value of winter forage for wildlife, primarily deer and elk. Controlled burns are also a management tool for removing decadent grasses. Riparian fencing is used to protect stream corridors in the PWSWA. The PWSWA is managed to also provide opportunities for the public to hunt, trap, fish, and engage in non-consumptive recreational activities.

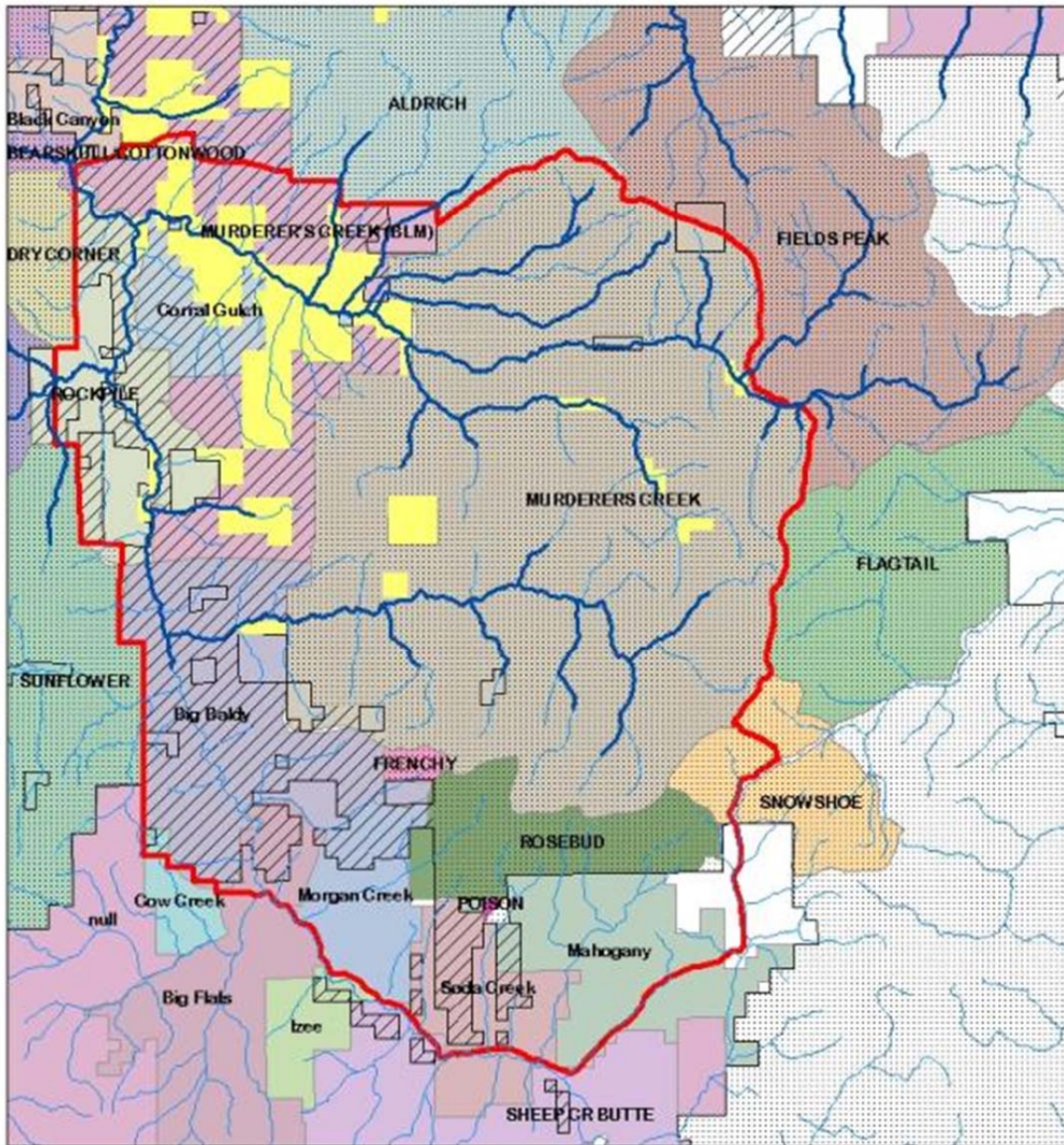
For PD lands, streams and wetlands on BLM-managed land have been assessed for condition using the Proper Functioning Condition (PFC) methodology outlined in BLM's Technical Reference 1737-9 of 1993, revised in 1995 and 1998 (Prichard *et al.* 1998). The majority of PD stream channels and floodplains within the John Day River basin planning area are not meeting the BLM standard of PFC. On the other hand, relatively few stream channels are non-functioning. More intermittent stream channels are in non-functioning condition than perennial streams, but they also have more miles of stream at potential and PFC (USDI-BLM 2008).

PFC is a qualitative method for assessing the condition of riparian-wetland areas. The term PFC is used to describe both the assessment process and a defined, on the ground condition of a riparian-wetland area. Given the sheer size of the district, the amount of acres covered, and the number of stream miles present on BLM land within PD, subsampling approaches are used.

The Technical Reference defines PFC riparian-wetland areas as functioning properly when having adequate vegetation, landform, or hydraulic controls such as large woody debris are present to:

- “dissipate stream energy associated with high water flow, thereby reducing erosion and improving water quality;
- filter sediment, capture bedload, and aid floodplain development;
- improve flood-water retention and ground-water recharge;
- develop root masses that stabilize streambanks against cutting action;
- develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses;
- and support greater biodiversity.”

Murderers Creek Wild Horse Territory



Legend



Figure 7. MNF and PD livestock grazing allotments that overlap in part or entirely contained within the Murderers Creek Wild Horse Territory.

If a riparian-wetland area is not in PFC, it is placed into one of three categories:

- Functional-At Risk (FAR) – Riparian-wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.
- Nonfunctional – Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality, *etc.*
- Unknown – Riparian-wetland areas that managers lack sufficient information on to make any form of determination.

PFC evaluates the stream reach but does take into account hydrologic factors such as the watershed condition with regard to potential for extreme flow events and the stream's potential over time, but is not necessarily equated to good quality fish habitat. The PD's PFC information contained in the biological assessment describes the baseline condition of the stream reaches within pastures that overlap the PD's portion of the Territory, and is currently the best information available. The PD states they will be updating the existing data with information obtained from their scheduled livestock use monitoring actions to help describe the trending conditions of the watersheds.

Much of the baseline information provided for understanding the current habitat condition found within the Territory is derived from MNF and PD landscape and stream assessments, and bringing forward habitat evaluation efforts completed through implementation of the livestock management programs for those allotments that overlap the Territory. Consistent or detailed information on wild horse impacts within the Territory are scant. However, the limited information that is available is presented in the BA, and summarized below and in section 2.4.1.1.

The following information is presented from current MNF's and PD's detailed descriptions of habitat conditions derived from livestock grazing consultations that cover the same geography as the wild horse Territory. In the allotments below, only the streams containing MCR steelhead and/or their designated critical habitat are discussed. Because wild horses can occur randomly throughout the Territory, but their habitats and patterns of use within the Territory are known to be concentrated, further focus will be placed on those pastures containing either high or medium concentration use areas by wild horses. Of most importance for this consultation are the wild horse concentration use areas that abut or contain MCR critical habitat. All of the identified concentration use areas containing or adjacent to designated critical habitat are located on MNF and PD lands. Focusing on the concentration use areas is an appropriate approach for this consultation given their repeated and predictable annual use by small bands of wild horses that make up the majority of the wild horse population of the Territory. Use of lands outside of these concentration use areas by wild horses are considered but of less concern for MCR steelhead and their designated critical habitat. This consultation evaluates the effects of wild horse use within the Territory at a herd size within AML (50-140 animals), as presented in the BA. The following discussion addresses the MNF (Murderers Creek and Fields Peak) and PD (Big Baldy) allotments that contain pastures with wild horse concentration areas that intersect with designated critical habitat.

2.3.1 MNF - Murderers Creek Allotment

The Murderers Creek Allotment lies entirely within the wild horse Territory and includes approximately 64,649 acres of MNF lands. Approximately 1,260 acres of private land, 1,432 acres of state land, and 326 acres of BLM lands are intermingled with NFS lands. Approximately 895 acres of private land and 792 acres of state land within the allotment are unfenced and management of these lands has not been waived to the Forest Service. The allotment is divided into 14 pastures: Frenchy Butte, Deer Creek, John Young Meadow, Redrocks, Martin Corrals, Dans Creek, Oregon Mine, Timber Mountain, Blue Ridge, Horse Mountain, South Fork Murderers Creek Gather, Murderers Creek Gather, Tex Creek Gather, and John Young Meadow Cow Camp. The pastures of Frenchy Butte, Deer Creek, Oregon Mine, Blue Ridge, and Horse Mountain contain one or more of the identified high or medium concentration use areas for the Murderers Creek wild horse population within close proximity of designated MCR critical habitat. The remaining pastures will not be discussed further in this consultation. Additional information on these remaining pastures may be found in NOAA Fisheries (2012) grazing biological opinion for Murderers Creek Allotment.

Streams in the Frenchy Butte Pasture containing MCR steelhead critical habitat are Vester Creek, Buck Creek, Blue Creek, and Deer Creek. MSRA is designated on Vester Creek, Buck Creek and Deer Creek. The MSRA on Vester Creek has been fenced off from cattle.

Streams in the Deer Creek Pasture containing MCR steelhead critical habitat are Corral Creek, South Fork Deer Creek, North Fork Deer Creek, and Deer Creek. MSRA is designated on North Fork Deer Creek, South Fork Deer Creek, Deer Creek and Corral Creek.

Streams in the Oregon Mine Pasture containing MCR steelhead critical habitat are Duncan Creek, unnamed Eastern and Western tributaries to Duncan Creek, Thorn Creek, Tennessee Creek, Oregon Mine Creek, and, Murderers Creek. MSRA is designated on Murderers Creek in this pasture.

Streams in the Blue Ridge Pasture containing MCR steelhead critical habitat are South Fork Murderers Creek, Blue Creek, and Bark Cabin Creek with MSRA designated on South Fork Murderers Creek and Blue Creek in the pasture.

The only stream in Horse Mountain Pasture containing MCR steelhead critical habitat is the South Fork Murderers Creek which is all a MSRA in this pasture.

Condition of Pastures with Concentration Use Areas and Critical Habitat

In the Frenchy Butte Pasture, the steelhead critical habitat on Vester Creek is located in a steep, heavily vegetated drainage except for one segment that has been excluded from livestock grazing with exclosure fencing completed in July 2011. Deer Creek has riparian areas with thick alder and dogwood stands. PFC assessment in 2004 rated Deer Creek Reach 1 as functioning at risk with no apparent trend. Neither wild horse use nor cattle grazing were identified as a limiting factor, but rather, structures placed in the channel were preventing the channel from narrowing. PFC assessment in 2004 rated Buck Creek Reach 1 as properly functioning with no apparent trend.

In the Deer Creek Pasture, approximately 0.7 mile of South Fork Deer Creek has been fenced to exclude cattle. PFC assessment in 2004 rated Deer Creek Reaches 2 and 3 and Corral Creek Reach 1 as functioning at risk with an upward trend. North Fork Deer Creek Reaches 1 and 2 were properly functioning with no apparent trend. North Fork Deer Creek Reach 1a was properly functioning with an upward trend.

There is a livestock trail that runs along the Eastern ridge of the Bark Cabin Creek drainage in the Blue Ridge Pasture approximately 0.5 mile above Bark Cabin Creek. This trail stays off the stream and ends near the confluence of Bark Cabin Creek and the South Fork of Murderers Creek.

Livestock access to the South Fork Murderers Creek in the Horse Mountain Pasture is limited to two water gaps by the August 2011 construction of a riparian corridor exclusion fence running the full length of the stream. This fence also excludes access to MSRA within the pasture except at the water gaps. There are no other streams containing steelhead critical habitat within the pasture.

Information on Wild Horse Use

In 2008, all livestock grazing in all units was enjoined by the District Court of Oregon. Vegetation and riparian monitoring conducted at the time to determine the impacts of wild horses revealed concentrated use in the Dans Creek, Deer Creek, and Frenchy Butte pastures. Utilization levels were high enough such that they would have limited or precluded cattle grazing on these pastures. The Murderers Creek wild horse population for 2008 was estimated at 460 animals, with 138 horses removed that year.

In 2009, wild ungulate (elk/deer) bank alteration on Blue Ridge Pasture reached 20% before turnout. Seventy-seven wild horses were removed from the territory that year resulting in a population estimate of 230 animals.

In 2010, pre-season livestock monitoring on Frenchy Butte, Deer Creek, and Blue Ridge pastures showed considerably less wild horse concentration areas than in previous years but a high-concentration area on Vester Creek in the Frenchy Butte Pasture and a high-concentration area on South Fork Deer Creek in the Deer Creek Pasture prompted placement of electric fencing to exclude wild horses and cattle. Wild horse use sites in the Blue Creek drainage and Bark Cabin Creek have required the permittee to keep cattle out of these areas. Many streams within the Blue Ridge Pasture, such as Bark Cabin Creek, are heavily protected by shrubs that limit animal access to crossings. Within the Deer Creek Pasture, three animal trail crossings were included in vegetative monitoring. The majority of the area is dominated by thick stands of alder so water access for cattle, wildlife and wild horses is limited to the crossings. In 2010, 46 horses were removed which resulted in a population estimate of 231 animals.

In 2011, most livestock grazing scheduled for the Murderers Creek Allotment was enjoined by the District Court. Although the Frenchy Butte and Deer Creek pastures were not enjoined, the permittee elected to not graze. With a removal of 60 animals, the wild horse population was estimated at 238 head in 2011.

The Murderers Creek wild horse census survey estimated a population of 257 animals for end of fiscal year 2012, after a removal of 83 horses. An additional 182 horses were removed by December 12, 2012, resulting in a wild horse population estimate of 75 animals at that time.

Recent livestock management implementation monitoring information for end of season indicators for the 4 pastures with high or medium concentration use areas in close proximity to MCR critical habitat, is presented in Table 8. This information is from the BA and MNF EOY reports for the Murderers Creek Allotment. **Table 9.** MIM Monitoring Results for the Murderers Creek Allotment, 2004-2011 (NM- Not Monitored, blank cells indicate no data reported).

Location and Indicators Monitored	Year*							
	2004	2005	2006	2007	2008	2009	2010	2011
North Fork Deer Creek Forest MIM DMA (Deer Creek Pasture)								
Bank Alteration (%)	13			7	15	3	1	
Stubble Height (inches)	16			12	12	14	15	
Woody Browse (%)	18			20	6	Slight to light (0-40)	10	
Bank Stability (%)	92			NM	NM	NM	100	
Covered Banks (%)	89			NM	NM	NM	100	
Deer Creek PIBO DMA (Deer Creek Pasture)								
Bank Alteration (%)	14	20		10	13	10	11	13
Stubble Height (inches)	18	14		8	14	17	22	
Woody Browse (%)	6	25		20	11	Slight to light (0-40)	8	
Bank Stability (%)	57	NM		NM	NM	NM	90	
Covered Banks (%)	84	NM		NM	NM	NM	90	
Deer Creek Forest MIM DMA (Frenchy Butte Pasture)								
Bank Alteration (%)	11	8		14	4	8	6	
Stubble Height (inches)	12	12		8	11	14	NM	
Woody Browse (%)	6	6		18	7	None to slight (<20)	NM	
Bank Stability (%)	46	NM		NM	NM	NM	88	
Covered Banks (%)	84	NM		NM	NM	NM	93	

* During years of non-use by livestock, little to no data may be gathered during annual monitoring efforts.

Steelhead Habitat Conditions and Trends

In the Murderers Creek Allotment, there are effectiveness monitoring integrator sites on Thorn Creek, South Fork Murderers Creek and Murderers Creek that were evaluated in 2003 and 2008. There are also DMA sites on Thorn Creek and Crazy Creek that were evaluated in 2008 and 2009, respectively. There is a DMA site on Deer Creek that was first evaluated in 2008. The BA states it appears that the monitoring site on Murderers Creek is at desired conditions and near reference conditions. The South Fork Murderers Creek has shown improvement for most attributes. Overall, bankfull width to depth ratios and bank stability have shown improvement

while the remaining evaluated attributes – bank angle, undercut banks, D50 (sediment particle size), pool percent, percent fines <6mm, residual pool depth, greenline wetland rating, and greenline woody cover – remained relatively unchanged. The BA states that there are too few reference sites within the John Day River basin to determine whether similar changes are occurring in unmanaged watersheds. Although only bankfull width to depth ratios and bank stability showed improvement, this is actually a promising indicator given that both Bengeyfield (2006) and Rosgen (1996) have indicated that the relationship between a stream’s width and depth is perhaps the most revealing of all stream channel indicators as to whether the stream is in a condition to perform the various tasks that lead to a healthy riparian area.

In regard to recently collected effectiveness monitoring data, the information obtained for evaluating the livestock grazing program concludes that while some attributes, such as channel shape and the frequent floodplain, are generally formed in 1.5- to 2- year events, others, such as habitat complexity, are formed during moderately high events of 10- to 25-year return intervals. If the stream cannot maintain its dimension, pattern, and profile during these moderately high events, then habitat or other desired values will probably not be created or sustained over time. Thus, given the short 5-year time frame between site visits for monitoring and developing trends, and the analysis of data, it is the MNF’s reasoned opinion that the evaluated attributes are being maintained or showing a slight overall improvement. Table 10 displays that over time, there has been little change in overall stream habitat conditions with the exception of the noticeable improvement of bankfull width to depth ratios and bank stability, on Federal lands of the MNF within the Murderers Creek Allotment.

Table 10. Environmental Baseline Habitat Parameters for Murderers Creek Allotment Streams within Focus Pastures.

Stream	Pasture	Year	Rosgen Channel Type or gradient	Percent Pools	Bankfull W/D	Percent Stable	Median Particle Size (mm)	Greenline Woody Cover
South Fork Murderers Creek 2-3	Blue Ridge	1992	3.5	46.9	8.8	92.8	Cobble	68
South Fork Murderers Creek 3-4	Blue Ridge	2007	5.5	60.7	10.3	99	Cobble	
South Fork Murderers Creek 4	Horse Mountain	1992	2	84	11	88	Sand	41
South Fork Murderers Creek 5	Horse Mountain	1992	1.5	46.9	20.3	86.8	Sand	23.9
South Fork Murderers Creek 6-7	Horse Mountain	2009	1	18	11.2	94	Sand	32.7
Bark Cabin Creek 1	Blue Ridge	1992	4	15.6	5	92.8	Sand	64.4
Deer Creek 1-4	Frenchy Butte	2007	1.6		15.7		Gravel	48.8
Deer Creek	Deer Creek	1991	1	31			Cobble	

Stream	Pasture	Year	Rosgen Channel Type or gradient	Percent Pools	Bankfull W/D	Percent Stable	Median Particle Size (mm)	Greenline Woody Cover
11-13								
Deer Creek 5	Deer Creek	2007	1.6		12.7		Gravel	44
Deer Creek 5	Deer Creek	2008	C4	62	17.6	88	ND	17.8
NF Deer Creek 1-4	Deer Creek	1993	4.5	43	6.7		Gravel	
NF Deer Creek 1-4	Deer Creek	2007	3.9		9.3	99.6	Sand	45
SF Deer Creek 1-2	Deer Creek	1993	2.5	67.1	5.1		Gravel	
SF Deer Creek 1-2	Deer Creek	2007	3.2	2.6	11.2	100	Sand	49
Corral Creek 1-4	Deer Creek	1993	5.5	27.3	7	79.3	Gravel	43
Blue Creek 1	Frenchy Butte	1995	3		12.1	72		28

Roads and Temperature

The Murderers Creek Allotment Deer Creek Pasture encompasses part of the Corral Creek watershed. The BA described this watershed as receiving a high road risk rating in the MNF road report. The Frenchy Butte Pasture encompasses part of the Lower Deer Creek watershed and this watershed received a high road risk rating in the MNF road report. The Blue Ridge Pasture encompasses part of the Bark Cabin Creek watershed and this watershed received a high road risk rating in the MNF road report. The BA states that high summer water temperatures, considered a major limiting factor, occur in Dan's Creek, Deer Creek, North Fork Deer Creek, Murderers Creek, South Fork John Day River and Tex Creek and are therefore, on the ODEQ 303(d) list for water temperature (ODEQ 2010). Data from a stream gage near the mouth of Murderers Creek showed that water temperatures exceeded 64°F, 54% of the time between July 1 and September 30, averaged over a 5-year period (ODFW 2005)..

2.3.2 Fields Peak Allotment

The MNF Fields Peak Allotment contains streams that provide critical habitat for the UJDR population and the SFJD population of MCR steelhead. The Fields Peak Allotment is located within the Upper John Day River (HUC # 17070201) subbasin. The pastures comprising the Fields Peak Allotment lie within the Murderers Creek (HUC # 1707020103), Fields Creek-John Day River (HUC # 1707020110), and Laycock Creek-John Day River (HUC # 1707020109) watersheds. The allotment includes approximately 30,718 acres. Approximately 272 acres of private land are intermingled with NFS lands. The private lands are unfenced and management of these lands has not been waived to the Forest Service. Elevations within the allotment range from approximately 3,200 feet in Fields Creek to 7,300 feet.

Allotment Pastures

The Fields Peak Allotment is divided into five pastures: Fields Peak, Tex Creek, Miners Creek, North Murderers Creek, and Murderers Creek. Both North Murderers Creek and Murderers Creek pastures are included in the ESA Action Area. The three remaining pastures will not be discussed further.

MCR steelhead critical habitat in the North Murderers Creek Pasture are Charlie Mack Creek, White Creek, and Basin Creek. MCR steelhead critical habitat in the Murderers Creek Pasture is designated in Murderers Creek and Lemon Creek. MSRA is designated on Murderers Creek. The streams used by the SFJD population within these two pastures are Basin Creek, White Creek, Charlie Mack Creek, Lemon Creek, and Murderers Creek.

Resource Activities

In 2008, a new permittee took over the permit for the Deadhorse, Hanscomb, and Fields Peak allotments and elected to take Non-Use of the majority of pastures with MCR steelhead critical habitat including the Fields Peak Pasture. In 2009 and 2010, the Fields Peak Pasture was again not used for livestock grazing. In 2009, the North Murderers Creek Pasture was created when a new fence was constructed along Murderers Creek and FS Road 21. The fence was constructed to provide for additional protection to Murderers Creek and allow for greater management flexibility and grazing rotations.

The North Murderers Creek Pasture was grazed in 2010 and 2011. The pasture contains critical habitat on Charlie Mack Creek, White Creek and Basin Creek. The fence that created the North Murderers Creek Pasture severed the pasture from the DMA on Murderers Creek and a new DMA has not been established for the North Fork Murderers Creek Pasture. The rest of the Fields Peak Allotment pastures, to include Murderers Creek Pasture, containing critical habitat were not grazed from 2008-2011, so recent implementation monitoring data is not available.

Steelhead Habitat Conditions and Trends

There is one effectiveness monitoring site on Murderers Creek in the Murderers Creek Pasture. Table 11 displays data obtained from field monitoring associated with the MNF livestock grazing program from 2003 and 2008.

Table 11. Baseline Habitat Parameters for Fields Peak Allotment Streams in Focus Pastures.

Stream	Pasture	Year	Percent Pools	Bankfull W/D	Percent Stable	Median Particle Size (mm)	Greenline Woody Cover
Murderers Creek K	Murderers Creek	2003	--	--	95	--	9
Murderers Creek K	Murderers Creek	2008	49.4	18.1	85	--	8

2.3.3 PD - Murderers Creek Allotment

The PD Murderers Creek Allotment (4020) has three streams within it, and four reaches. This allotment uses a spring grazing strategy managed through use of on/off dates. Livestock are present on the 16,004-acre pasture for approximately 20 days two out of three years. Cabin Creek, South Fork John Day River, and Cougar Gulch are within this allotment. There are 7.6 miles of perennial streams, 48.0 miles of intermittent streams, and 5.9 miles of MCR steelhead designated critical habitat. The MCR steelhead period of use is March through October (spawning and rearing).

Cabin Creek was rated at PFC from 2001 data and appeared to be approaching PNC in 2001. Cabin Creek provides spawning and rearing habitat. Due to the thick stand of woody vegetation there is little to no recorded livestock or wild horse use.

South Fork John Day River was rated as PFC from data of an unknown date (the PD states that the field forms justifying the rating are missing). This segment provides spawning and rearing habitat. Limiting factors for MCR steelhead are embedded substrate in spawning areas, low pool volume for rearing, and elevated water temperatures. The high sediment load coming from upstream sources appears to be a major component of the limiting factors. There are some stretches fenced thereby excluding animal access.

Cougar Gulch was rated as PFC and was in excellent condition in 2001. Monitoring of livestock use showed grazing did not appear to be affecting the riparian area or creek channel. Cougar Gulch has marginal spawning and rearing habitat due to its gradient and intermittent flows. Lower reach riparian plant community was very dense and the grazing appeared to not be adversely affecting the riparian vegetation. There are several fences that aid in reducing animal access, and it appears that the management is effective in protecting the riparian zone. The middle reach was in excellent condition. The upper half of the reach was in pristine condition. There had been no timber harvest in the upper half of the reach and it was at PFC.

Current Monitoring for Murderers Creek Allotment

Monitoring for this allotment will be used to cross reference back to the PD's adaptive management process to ensure the animal use will not exceed allowable management levels. As a part of the PD grazing program, monitoring will be as follows: Compliance (annually), photo points (every 5 years), redd counts (annually), and utilization (every 5 years) and PACFISH implementation (bank alteration, stubble height, and woody browse will occur every five years). A new schedule for PACFISH monitoring is being developed for all category 1 pastures.

2.3.4 PD - Big Baldy Allotment

The PD Big Baldy Allotment (4052) has two streams within it and two reaches. This allotment uses a spring grazing strategy managed by altering the permit animal unit months (AUMs) and on/off dates. This allotment contains 12,726 acres of BLM land, and provides 600 AUMs of grazing forage for livestock. Deer Creek and South Fork John Day River are within this allotment. There are 11.8 miles of perennial streams, 19.0 miles of intermittent streams, and 4.4 miles of MCR steelhead designated critical habitat. MCR steelhead period of use is March

through October (spawning and rearing). The season of livestock use is from April 15 to May 31 every other year on odd numbered years.

The South Fork John Day River was rated as PFC, the actual field forms justifying the rating are missing at this time. This segment provides spawning and rearing habitat. Limiting factors for MCR steelhead are embedded substrate in spawning areas, low pool volume for rearing, and elevated water temperatures. The high sediment load coming from upstream sources appears to be a major reason for the limiting factors. Due to high flows when livestock are in the pasture, access to streambanks and riparian vegetation are limited.

Deer Creek was rated as PFC in 2004. The riparian vegetation was extremely thick in most areas and added to the large boulder substrate and steep gradient of most stretches of the creek; pose a significant barrier to livestock. It is unlikely that livestock can access most of the potential spawning and rearing habitats along Deer Creek. The Deer Creek tributary to the South Fork John Day contained mock orange, choke cherry, red osier dogwood, coyote willow, cottonwood, willow spp., alder, wild rose, and service berry. Previously installed instream log structures seemed to be functioning for their designed purpose.

Current Monitoring for Big Baldy Allotment

Monitoring for this allotment will be used to cross reference back to adaptive management to ensure the grazing actions will not exceed allowable levels. Monitoring will be as follows: Compliance (annually), photo points (every 5 years), PIBO EM Site #1035 Deer Creek (next reading 2013) and PACFISH Implementation (bank alteration, stubble height, and woody browse will occur at the end of the growing season in 2012 & 2013), and redd counts (annually). A new schedule for PACFISH monitoring is being developed for all category 1 pastures. BLM will notify NMFS if the monitoring year changes.

2.3.5 Wild Ungulates

Wild ungulates have been present in the action area at various concentration levels throughout recent times. The ODFW has influenced elk and deer populations through regulated hunting for many decades. Elk and deer utilize streamside vegetation differently. Both eat riparian vegetation, but have different forage preferences. The diets of elk, deer and horses are very different during early summer and become increasingly similar during late summer. Horse diets have more grasses, deer diets have more shrubs and forbs, and elk diets are intermediate between those of cattle and deer. There is overlap between what each species will eat depending upon season and availability. Cattle tend to displace elk, and elk tend to displace deer, and horses tend to avoid cattle. Except in uncommon times and places when animals are concentrated, or food is lacking, elk and deer grazing are similar to horse grazing and do not approach cattle grazing in magnitude of ground cover removed or mechanical hoof perturbation of soils. In some limited circumstances, elk and deer browsing can significantly inhibit establishment and growth of shrubs and small trees.

The ODFW manages elk and deer populations in the area containing the wild horse territory through management of the Murderers Creek Wildlife Management Unit (WMU) and a portion of the Ochoco WMU. A forage production and utilization study was conducted in 1983 in four

pastures of the MNF Murderers Creek Allotment (Timber Mountain, Horse Mountain, Blue Ridge and Frenchy Butte) and showed that cattle used between 61-80% of forage compared to wild horse use of 13-18%, deer use of 4-12%, and elk use of 2-15%. Both elk and deer utilize streamside vegetation differently in that elk prefer grasses and forbs, while mule deer prefer shrubs. The ODFW's elk and deer herd size management objectives for the Murderers Creek WMA are 1,700 and 9,000, respectively. For the period 2004-2010, herd sizes have ranged between 1,700-1,900 for elk, and 5,207-6,968 for mule deer. The BA states that additive effects from wild horse, elk, and deer use of some riparian areas within the territory can negatively impact stream sides, particularly when the wild horse population exceeds AML.

2.4 Effects of the Action on Species and Designated Critical Habitat

“Effects of the action” means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

The BA contains a thorough description of the proposed action including management measures designed to reduce the impacts of wild horses and their management within the Territory. The BA divides the proposed action into eight project elements: three habitat-based and five regarding management of the horse population. They include: (1) Wild horse use of MNF and PD lands within and adjacent to the Territory; (2) maintenance of troughs, springs and pond upland watering sites; (3) habitat monitoring of riparian conditions within the Territory through implementation of monitoring requirements of the livestock grazing program; (4) wild horse gathers; (5) wild horse population census taking; (6) monitoring of wild horse seasonal distribution; (7) humane destruction; and (8) fertility control. The analysis in this opinion will focus on elements 1, 3, and 4. The activities of elements 2 and 5-8 do not have any direct effects, or effects are minor or beneficial on MCR steelhead and MCR designated critical habitat. Elements 2 and 3 are completed in association with implementing the MNF livestock management program of work on lands within the Territory; however, the overlapping nature of the grazing allotments and Wild Horse Territory make them relevant for consideration in examining the impacts of implementation of the WHMP. The effects discussion considers impacts of the proposed action with respect to the life cycle of MCR steelhead and the applicable PCEs of critical habitat (spawning, rearing, and migration).

The following effects analysis is based on the best information currently available as of the date of this opinion. The effects of the action, as proposed, likely include: (1) A seasonal reduction of riparian vegetation in the area of the Territory that have concentrated use by wild horses in and around accessible stream reaches; (2) wild horse trampling of the stream bank, resulting in excess fine sediment adversely affecting stream substrate conditions; and (3) disturbance of rearing juvenile MCR steelhead by wild horses approaching, entering, and crossing streams.

2.4.1 General Wild Horse Management Effects

2.4.1.1 Direct Effects on MCR Steelhead

The direct and indirect effects of implementing the action on the listed species and designated critical habitat follow. There are no interrelated or interdependent actions to evaluate for this consultation. In addition, the probability of directly affecting juveniles, spawning adults, and incubating embryos in redds will be assessed. The BA presented an evaluation of impacts of implementing the project elements (PE) using the NMFS MPI indicators.

Consistent or detailed information on wild horse impacts within the Territory are scant. However, the limited information that is available is presented in the BA. The WHMP (MNF *et al.* 2007) describes a 1983 Utilization and Distribution Study for the wild horses of the Territory. It states:

The 1983 Utilization and Distribution Study included in the 2210 Analysis File concluded that with 100 head of horses the natural elevation, seasonal migration, and the scattered territoriality of the bands, no significant problems would be expected related to the proper use of the forage species. When the herd was around the 200 head level (1979), significant use (and damage) occurred at Vester Meadows and the South Fork of Murderers Creek while at 100 head few areas of concentrated use were found and no areas of damage were found.

This best available information is used as the foundation for setting the AML of 50-140 horses, averaging 100 animals. The map (Figure 3 above) is derived from Appendix G of the BA, and displays the areas of high and moderate concentrated use by wild horses within the Territory. The MNF affirms the information that went into the map includes areas of focused use leading up to the development of the plan in 2007, which would incorporate a much higher herd size than the AML objective. Use of this articulation of concentration use areas as a foundation of distributional impacts of wild horses within the Territory, therefore, incorporates in the analysis a herd size within AML with some exceedence.

The MNF Murderers Creek Allotment 2008 End-of-Year Grazing Report (MNF 2009a) stated that concentrated use of wild horses was evident in the Dan's Creek, Deer Creek and Frenchy Butte units. Sites were reported to range from less than one acre to approximately 200 acres (Frenchy Butte). No information regarding wild horse concentration areas was provided in the 2009 End of Year Report (MNF 2009c).

The narrative for the Murderers Creek Allotment in the 2010 End of Year Grazing Report (MNF 2011a) stated that "wild horse use and their concentration areas are considerably less than in previous years." A horse concentration area was identified on Vester Creek in the Frenchy Butte Pasture. The Blue Ridge Pasture also had significant wild horse use in the Blue Creek drainage. The Deer Creek Pasture (which had been grazed by cattle prior to monitoring) was recorded as exceeding the streambank alteration (SA) standard of 10% by 1%. It was explained that this was due to three crossings that were used by wildlife and wild horses in addition to cattle.

The results for riparian habitat monitoring as a part of the grazing program were presented earlier in the Environmental Baseline section. Use standards were exceeded even though no livestock grazing took place in several instances in 2008 and 2009 monitoring of the Murderers Creek Allotment. This was attributed to wild horses, but could not conclude other wildlife were not also a contributing factor. Specifically:

In 2008

- The utilization of grass and non-hydrophytic species (UGNHS) standard of 45% use was exceeded at 86% at the Frenchy Butte DMA #1 site. This was attributed to extremely heavy use by horses in a large area at the head of Antelope Creek.
- The 10% standard for SA was exceeded at Deer Creek sites DMA #1 (15%) and DMA #2 (13%).

In 2009

- The SA standard of 10% was exceeded at 20% for the Blue Ridge Pasture

The MNF identified wild horse concentration use areas that include Vester Meadow, upper Blue Creek, South Fork Murderers Creek in the Horse Mountain Pasture, Bark Cabin Creek and Beaverdam Creek. The BA states that for the targeted AML herd size, the wild horse population is normally broken up into small bands or groups and that most of the concentration use areas are 1-2 acres or less. Larger areas of concentration use have likely occurred in past years when wild horse herd sizes were substantially more than AML numbers, but those high numbers are not expected to occur during the life of this plan.

It is reasonable to presume that, in combination with information on horse concentration use areas presented in Section 2.3 above and in the map (Figure 3) displaying wild horse concentrated use areas in relation to MCR steelhead critical habitat, the streams and locations shown in Table 3 (see Section 1.4) are the areas within the Territory most likely to have any potential for measurable effects to the PCEs of critical habitat from wild horses. The BA also identified Dan's Creek (Dan's Creek pasture of Murderers Creek allotment) as an area that experienced habitat impacts due to wild horses during past years when the horse population was well in excess of AML (>400 animals).

The BA presented a review of the scientific literature showing the potential environmental impacts that may be attributed to wild horses. As wild horses approach streams to drink or cross they could interrupt spawning behavior by forcing adult steelhead to retreat to nearby cover. Wild horses do not tend to dwell in and around streams during spawning season, other than to drink or when traversing the area on traditional routes.

Steelhead in the John Day River basin, spawn during high spring flows between March-May with spawning peaking in April. Adult steelhead either die or swim downstream after constructing redds where they deposit eggs. Depending on water temperature in the John Day River system, eggs and alevins remain in redds for approximately 45 to 60 days. During this time, redds are susceptible to trampling by horses. By June 30, most alevins have emerged from the gravel and the susceptibility of redds to trampling drops significantly.

Given the planned AML management numbers for the Territory, wild horses are unlikely to cause measurable impacts to tributary habitat within the action area outside of identified high and medium concentration use areas when they intersect with designated critical habitat. To the extent where there are possible riparian impacts outside of these documented concentration use areas, they are likely to be small and have minimal impacts on steelhead, their habitat and associated PCEs, given the MNF's ability to achieve AML and their plan to maintain the herd at the lower end of AML. Where these concentration use areas coincide with known or predicted MCR spawning areas, wild horses could interrupt spawning or other adult behavior. The most current gather data (Table 2, above) displays how MNF is aggressively gathering horses to reduce the population size so as to achieve the proposed action of lower AML, which was achieved on January 2, 2013, when the herd, minus recent gathers, reached an estimated 57 horses. Because of behavior and habitat use patterns of wild horses, and the distribution of the concentration use areas, there is little likelihood that wild horses will interrupt spawning steelhead. For this proposed action, NMFS does not expect adult steelhead behaviors to be impaired nor spawning to be interrupted.

It is presumed the horses have the possibility to trample redds, which if occurring, is reasonably certain to result in partial or total mortality of embryos or juveniles concentrated in the redd. Salmonid embryos are vulnerable to mechanical disturbance, and their sensitivity varies with developmental stage (Peterson *et al.* 2010). Roberts and White (1992) reported that a single wading incident on a simulated spawning redd killed 43% of pre-hatching embryos and twice-daily wading throughout embryo development killed at least 83% of eggs and pre-emergent fry.

MCR steelhead eggs and pre-emergent fry can be injured and killed when redds are trampled. Given wild horse population numbers within AML, their propensity to be in small bands dispersed over the vast Territory, the wild horse's general habit of not concentrating in riparian areas, and the high stream flows when eggs and pre-emergent fry are in redds, it is extremely unlikely that wild horses will step on occupied redds and would certainly be within the background level of occurrence by elk and deer.

As a part of MNF's grazing management program, pre-livestock turnout stream surveys that locate spawning steelhead and redds are conducted on 100% of MSRA designated critical habitat and 20% of non-MSRA designated critical habitat. These spawning surveys provide much needed information to greatly reduce the likelihood that redds will be vulnerable to trampling. MNF uses a number of tools to prevent livestock from disturbing spawners and protect redds from trampling such as installing temporary exclosure fences. These techniques are also believed to help minimize any likelihood of wild horses interacting with identified MCR redds as well.

After reviewing all the available information including the BA, NMFS concludes that it is extremely unlikely that any MCR steelhead redds will be disturbed by the proposed action. Due to the vast size of the Territory, it is even more unlikely that any redd that was disturbed would be observed during the annual MNF redd surveys conducted prior to livestock turn out. Redd trampling could result in the death or injury of MCR steelhead eggs or pre-emergent fry. However, the probability of any redds being trampled by wild horses is extremely low, and would certainly not exceed the background levels caused by other wild animals. This is supported by the fact that wild horses spend a majority of their time in uplands on steeper slopes

than cattle until winter drives the animals to lower elevations along the mainstem South Fork John Day River, during which time MCR steelhead redds are not present.

Wild horses are known to use a few trails repeatedly to cross the landscape. Horses also use only a few trails to travel to and from water (particularly during the driest seasons), traveling farther from water each day than do cattle (MNF 2012 summary of Beever 2003).

Rearing juvenile MCR steelhead are likely to be disturbed by wild horses approaching, entering, and crossing streams. Juvenile MCR steelhead may respond by leaving near shore cover and entering open water where they are more vulnerable to predation. Reinhart and Healey (1997) discussed the increased predation susceptibility of coho salmon (*O. kisutch*) when fish used areas with limited cover. Similarly, Grant and Noakes (1987) discussed the dispersal factors of young-of-year brook trout (*Salvelinus fontinalis*) with regard to proximal distance to approaching human observers and relative availability of cover. Due to their similar biology, behavior, and life history, we would expect MCR steelhead to respond in an equivalent manner. As such, juvenile fish fleeing from cover due to approaching wild horses could lead to death or injury of these individuals if nearby cover is not readily available. Wild horses entering streams may also cause juvenile steelhead to temporarily abandon other critical behaviors such as feeding. Lima and Dill (1990) investigated predation risks taken by various animal types, suggesting there is a decision process in place that incorporates various predation avoidance tactics depending on predators' primary hunting methodology. As such, we believe the spooking of juvenile MCR steelhead out of their preferred hiding cover places them at risk to nearby visually-oriented predators (avian or fish).

The occasional disruptions caused by wild horses are not expected to result in any significant decrease in abundance or productivity of juvenile MCR steelhead at the population scale. This is because the disruptions to essential juvenile behaviors of feeding and sheltering are likely to be limited to the few stream reaches where wild horses approach or enter the water for drinking or their cross-country movement patterns, such as those mapped wild horse concentration areas identified by MNF that intercept with MCR steelhead critical habitat. Disruptions are not likely to occur in streams that are less accessible due to the occurrence of dense woody vegetation around the streambanks or the presence of large amounts of down woody debris near streams, or when the stream is bordered by steep topography. Additionally, many pastures within the Territory contain pasture and resource protection fencing established to minimize livestock interactions with MCR steelhead critical habitat, will also tend to limit wild horse movement or stream access. As such, the area where wild horses are anticipated to interact with MCR steelhead is very small compared to the total area of the Territory available to rearing juveniles.

2.4.1.2 Direct and Indirect Effects on MCR Steelhead Habitat⁴

The MNF proposes a suite of management measures and project design criteria to reduce the effects of wild horses and their management activities on MCR steelhead habitat. The WHMP contains specific implementation measures necessary when conducting wild horse gathers,

⁴ This section addresses direct and indirect effects of the proposed action on MCR steelhead habitat and how those effects impact individual fish and population dynamics. The discussion also is relevant to effects to MCR steelhead critical habitat, addressed in section 2.4.2 below.

placement and operation of temporary trapping and holding corrals, horse transporting activities, and activities associated with aerial population surveying techniques.

Horse Census

The BMRD Wild Horse Specialist conducts the wild horse surveys with the assistance from BLM Wild Horse Lead for Oregon and Washington, and a representative from PD. The wild horse surveys usually are conducted with the use of helicopter flights laid out in a grid pattern that covers the entire Territory. As Table 1 (above) presents, a census will be conducted every 2 or 3 years, depending upon need, and confidence of coverage from prior survey effort. Surveys are believed to have varying ability for observing all animals, so depending on topography, visibility, animal movements, etc., the survey count numbers are added to by using an adjustment factor. The MNF's most recent horse census of 2011 is believed to provide a good population estimate given the combination of a thorough search pattern, good visibility, and excellent weather conditions.

Horse Gathering

Table 12 displays the wild horse population estimates from the past several years as presented by the MNF in the BA. Table 1 (above) presented planned horse gathering and survey schedule for the period 2012-2016. The Management Plan (MNF *et al.* 2007) stated that the 2006 summer census counted 436 horses. There was no population census in 2007 or 2008. An estimate of 230 horses was made for 2009.

The most recent census was conducted by helicopter in winter of 2011 of which counted 132 horses with a projected population estimate of 198 head. With a 20% recruitment factor, the Horse herd was estimated to be at 238 by the end of 2011. In the fall of 2011, an additional 80 horses were removed from the territory dropping the herd size to approximately 158 horses.

It is the intent of the MNF to continue to gather horses until the herd is within the side boards of the established AML of 50-140 horses, averaging 100 horses. Given the recent FY2013 successes in removing 200 horses, the MNF currently estimates the wild horse population within the Territory is 57, near the lower end of AML.

Table 12. Murderers Creek Wild Horse Territory/Herd Management Area Population Estimates and Horse Removal Numbers (updated 2 January 2013).

Fiscal Year	Number of Horses Removed	Resulting Population Estimate	MNF Comments
2013*	200	57	*Incorporates all wild horses gathered through January 2, 2013, as well as 40 horses removed in September 2012. Current population estimate doesn't include recruitment which will be applied in the spring of 2013
2012	83	257	2012 census counted 161 animals. Applied correction factor of 7.5-32% undercount as described in Lubow and Ranson (2009) puts population estimate at 173-213. Recruitment of 20% brings total to 257.
2011	60	238	2011 census counted 132 animals w/an estimate of 198 total. Add the 20% recruitment to reach the estimated pop. of 238.
2010	46	231	Estimate based upon 2009 census and 2009/2010 removals.
2009	77	230	115 horses observed, used 100% correction factor, based on viewing conditions
2008	136	460	
2006	0	430	conducted on the ground census from July to September 2006
2005	99	90	AML and Est. Pop. is 75% of total with BLM.
2004	55	193	
2003	6	220	
2002	0	193	
2001	53	165	Estimates
2000	0	180	Estimates

On occasion, wild horses are found outside the Territory boundary in small numbers in all directions. The 2007 Management Plan states that the actual range of the herd adds an additional 37,000 acres of Forest Service ground, and maps in Appendix G of the Management Plan display this area as extended territory. The BA states that it is estimated that only 10-15 wild horses use this additional area.

The MNF conducts pre-turnout monitoring for livestock grazing of riparian condition to ensure habitat condition is conducive to implementing that season's grazing activities. This annual review step and potential for postponement or cancelation of annual grazing for Murderers Creek allotment is a useful adaptive management tool the MNF implements to help minimize adverse impacts to MCR steelhead and designated critical habitat. This management practice, along with maintaining a wild horse population within the AML of 50-140 horses, averaging 100 animals over time, will promote stabilization and improvement of riparian resources within the Territory.

The proposed action includes the placement and operation of temporary corrals for bait trap capturing and for horse holding pens prior to removal and transport of the captured wild horses to facilities outside of the action area. The BA includes restrictions on location, construction, and operation of these corrals to ensure they will have no adverse effect on the quality of stream or riparian habitat.

Managing the wild horse population at AML in the Territory will likely result in a minimization of riparian impacts, which in turn, promotes recovery of degraded riparian habitat to occur, as wild horse numbers will be maintained below the current population level and that of the recent past. As stated above, horse herd sizes in the range of AML (50-140 animals) results in smaller bands of animals dispersed within the Territory using documented concentration use areas. By managing the wild horse size within the range of AML, with the objective of averaging 100 animals, the MNF's wild horse management efforts will likely promote the gradual improvement of streamside and riparian habitats within the Territory.

Riparian Vegetation

Wild horses tend to use habitats in the proportion in which they are available. Additionally, even though horses are one of the least selective grazers in the American West, the diet of horses showed them to have a 60-80% similarity in diet with cattle (Beever and Brussard 2000). The amount of overlap is dependent on season, location, and plant availability. Wild horses tend to travel using a few trails repeatedly to cross the landscape. They also use only a few trails to travel to and from water sources during the drier seasons, with the distance traveled from water each day greater than do cattle.

These animal traits and habitat use patterns support the understanding that wild horses do not linger in riparian areas. In part to avoid livestock cattle and insects, they will also move to higher elevations and steeper ground, and only travel to and from water sources for drinking and foraging.

Therefore, removal of riparian vegetation will likely result only from use of routes by wild horses for purposes of traversing the Territory or reaching drinking water, be it from streams, wetlands, upland springs, or man-made livestock watering sites. These sites will likely be scattered across the landscape, with a higher probability of use and access for those riparian areas closest to the high and moderate concentration use areas identified by MNF.

Removal of riparian vegetation through wild horse travel routes and watering locations can reduce habitat quality and result in negative impacts on fish production (Platts and Nelson 1989). Reductions in streambank cover related to overhanging vegetation, root vegetation, and undercut banks have been correlated with reduced fish production (EPA 1993). This is particularly evident in meadow systems, where herbaceous vegetation may provide the only shade to stream channels. As noted in the BA, maintaining the population within AML (50-140 animals, averaging 100 horses) over the life of the plan will greatly reduce the likelihood of riparian damage from horses.

Stream cover and shade in hardwood-dominated riparian systems can also be damaged by animal concentrations. Shrubby vegetation, such as willows, may be an important source of shade along

smaller streams and in mountainous areas (Henjum *et al.* 1994). Horses tend to travel to and from watering sites daily. The wild horse high and moderate concentration use areas identified by the MNF are primarily located in the uplands, with a small portion of less than half of these sights adjoining or containing streams with MCR critical habitat. When the population is maintained at AML within the Territory, the impact of wild horses on riparian woody shrubs and trees will be so slight that it cannot be meaningfully detected.

By maintaining the wild horse population within AML (50-140 horses, averaging 100 animals) over time, it is likely that riparian plant communities in the action area will improve. As riparian areas recover, streams will begin to narrow, overhead cover will increase, and undercut banks will develop. In general, habitat quality for MCR steelhead will improve. Overtime, the improvements to stream habitat within the Territory will lead to increased survival of juvenile MCR steelhead. This in turn will eventually lead to improvements in MCR steelhead population abundance and productivity.

Shade and Stream Temperature

Water temperature is an important factor affecting distribution and abundance of MCR steelhead within the action area. Water temperatures influence water chemistry, as well as every phase of salmonid life history. The BA reports optimal temperatures for steelhead are 50° to 61°F (10° to 16°C), and the lethal temperature is approximately 77°F (25°C). Bell (1986) reported the upper lethal temperature for steelhead to be 75° F, with a preferred temperature range between 50 and 55°F. The ability of rearing steelhead to tolerate temperature extremes depends to a certain degree on the fish's recent thermal history; however, research indicates that most salmonid species are at risk when temperatures exceed 73 to 77° F (Spence *et al.* 1996).

In addition to the lethal effects of high temperatures, salmonids rearing at temperatures near the upper lethal limit have decreased growth rates because nearly all consumed food is used for metabolic maintenance (Bjornn and Reiser 1991). Temperatures exceeding the upper lethal limits may be tolerated for brief periods or fish may seek thermal refugia. Li *et al.* (1991) reported that resident rainbow trout in an eastern Oregon stream selected natural and artificially created cold water areas when temperature in the main stream channel exceeded 75.2°F but showed no preference for these areas when temperature in the main stream channel was less than 68°F. Coldwater refugia, such as springs and groundwater seeps, allow some steelhead to persist in areas where temperatures in mainstream channels exceed their upper lethal limit. However, total steelhead production in streams will tend to decrease if the amount of habitat suitable for the species use is restricted to areas of cold water refugia.

Stream temperatures are of particular concern within the John Day River basin. This is highlighted in the John Day Subbasin Plan (NPCC 2005) as well as the MCR Steelhead Recovery Plan (NMFS 2009). Degraded water quality, which includes elevated water temperatures, is identified as a limiting factor for MCR steelhead in both plans. Stream temperature is influenced by a number of factors including site conditions, weather, riparian vegetation, and input of solar radiation. MNF (2011) noted that solar radiation is the most important source of radiant energy affecting stream temperature. Removal of riparian vegetation can decrease shade which increases the amount of solar radiation reaching streams. Stream

temperature is also affected by stream width-to-depth ratio, condition of riparian soil, and hydrograph.

When these factors that affect stream temperature are taken into account with maintaining the wild horse herd at AML, the wild horse use patterns within the Territory, their daily and seasonal habits, and their limited use of riparian areas and resulting minimal impact to shade-producing vegetation, NMFS does not expect wild horse activities will have any more than a minor effect on streamside shade-producing vegetation and that effect will not translate into a measurable increase in water temperatures.

Sediment and Turbidity

Grazing by large herbivores can result in hoof shear to streambanks (McIver and McInnis 2007) and trampling and consumption of streamside vegetation. Wild horse access to streambanks or exposing bare soil in repeated use of travel routes and subsequent erosion may add fine sediments to stream substrates. Mass wasting of sediment may occur along streambanks where animals walk on overhanging banks (Behnke and Zarn 1976; Platts and Raleigh 1984; Fleischner 1994). Concentrated use of an area by large herbivores can create trails and expose bare soil which is later washed into streams during precipitation events.

The use of vehicles in support of animal hauling and transporting from the Territory after capture on and near roads, can also create the potential for some fine sediment to be transported from unpaved roads to stream channels, primarily at road crossings, during rainstorms or runoff events. Due to the limitations placed on vehicles used in trapping and hauling captured horses, the amount of fine sediment generated by vehicles is expected to be extremely small.

Increases in fine sediment lead to greater substrate embeddedness and a decrease in interstitial spaces in gravel substrate important for MCR steelhead spawning. Increased substrate embeddedness also impairs food production (discussed in greater detail below) and blocks refugia for young salmonids (Rinne 1990), thus reducing the quality of spawning and rearing habitat available. Salmonid survival at early life stages has been inversely linked to the amount of surface fines in stream substrates (EPA 1993). Juvenile salmonids depend on clean substrate for cover, especially for over-winter survival (EPA 1993). Successful salmonid spawning requires clean gravels with low fine sediment content (Spence *et al.* 1996). Excess fine sediment can fill pools needed by juvenile MCR steelhead for resting, hiding and foraging.

Fine sediment entering streams can also create turbidity. An increase in turbidity can adversely affect juveniles. At moderate levels, turbidity has the potential to reduce primary and secondary productivity; at higher levels, turbidity may interfere with feeding and may injure and even kill both juvenile and adult salmonids (Berg and Northcote 1985; Spence *et al.* 1996). However, Bjornn and Reiser (1991), found that adult and larger juvenile salmonids appear to be little affected by the high concentrations of suspended sediments that may be experienced during storm and snowmelt runoff episodes.

Exposure duration is a critical determinant of the occurrence and magnitude of turbidity caused by physical or behavioral turbidity effects (Newcombe and Jensen 1996). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high

suspended sediment loads, often associated with flood events, and are adapted to such seasonal high pulse exposures. However, research indicates that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Servizi and Martens 1991). In a review of 80 published reports of fish responses to suspended sediment in streams and estuaries, Newcombe and Jensen (1996) documented increasing severity of ill effects with increases in dose (concentration multiplied by exposure duration).

The amount of fine sediment introduced into streams by wild horse accessing streams or vehicle use of roads at any one time will be small. Implementing the MNF's Wild Horse Management Plan will allow for increased ground cover over time through minimization measures in place for all activities near streams by transport vehicles, placement of horse-trap corrals, and placement and operation of temporary holding corrals associated with wild horse management. Any pulses of turbidity caused by sediment generated from these activities are likely to be small and last for a short time. When fine sediment is introduced to streams during high flows, the turbidity created will not be observable above background levels. Although the creation of turbidity during low flow may occasionally interrupt juvenile steelhead behaviors such as feeding, these interruptions will not be significant enough to reduce juvenile steelhead survival.

The primary method to reduce the introduction of fine sediments from wild horses is to limit the herd population size. The MNF proposes maintaining a herd size in the AML range of 50-140, averaging 100 animals. As stated above, the BA stated that riparian habitat impacts are not noticeable when the population is less than 200 animals. As such, our analysis evaluates a herd size of AML, and incorporating a short duration and slight overage of the upper end of AML herd size, knowing the MNF's objectives are to stay within, and target the lower end of, AML.

As a part of implementing their livestock grazing program, MNF will also evaluate the Murderers Creek allotment for pre-turnout riparian and bank conditions. Implementation of the MNF's proposed streambank endpoint indicators as a part of their livestock management program will provide any early indication of changes in horse use or concentration areas within the Territory as it relates to riparian conditions. This annual monitoring will also enable MNF to adjust livestock grazing to allow recovery of any disturbed areas caused by wild horse or wildlife use of riparian areas.

The proposed action will result in a small amount of fine sediment entering streams. This fine sediment will be primarily generated by exposure of bare soil by wild horses using trails for movement and riparian areas for access to water, and less so through implementing horse gathering and transport techniques. Bank trampling may occur at locations where streambanks are composed of soils or soil and rock mixtures. Excessive levels of fine sediment in stream substrates can reduce MCR steelhead egg survival, reduce forage available for juveniles, and decrease available refugia sites within stream substrates. Establishing wild horse herd size limits and appropriate protocols for placement and operation of trapping and holding corrals, as well as animal transport processes, further restricts the potential for management action-caused sediment transport to streams.

Although some individual MCR steelhead will experience the adverse effects associated with fine sediment inputs, this will not appreciably reduce or prevent the increase of population-scale

abundance or productivity. This is because the amount of fine sediment introduced into streams at locations where wild horses and horse management activities impact streambanks will be small and limited primarily to the MNF-identified horse concentration use areas in close proximity to designated critical habitat. Additionally, not all stream reaches within the action area have streambanks that are prone to the effects of wild horse activity.

Prev Base

The cold water communities (aquatic invertebrates and other coldwater fish) which rearing juvenile steelhead rely on for food require minimum dissolved oxygen levels of between 6 and 8 mg/L (ODEQ 1995). In streams without adequate riparian vegetation, temperatures increase and dissolved oxygen levels drop. Cold water communities shift from salmonids and less tolerant aquatic invertebrates such as mayflies and stoneflies to warmer water species dominated by sculpins and more tolerant aquatic invertebrates such as chironomids. A study by Li *et al.* (1994), in the John Day River basin, found that colder streams supported the highest standing crops of trout and had the most favorable trout-to-invertebrate standing crop ratios. This suggests that colder streams in this basin have a greater trophic efficiency leading to increased salmonid production.

Reducing riparian vegetation can reduce habitat for terrestrial insects, an important food for juvenile salmonids (Platts 1991). Riparian vegetation also directly provides organic material to the stream, which makes up about 50% of the stream's nutrient energy supply for the food chain (Cummins 1974 cited in Platts 1991). This allochthonous material provides an important food source for aquatic insects which, in turn, become prey for salmonids. Consequently, removal of riparian vegetation can affect the diet of fish by reducing production of both terrestrial and aquatic insects (Chapman and Demory 1963).

These studies underscore the need to manage wild horses and associated activities in a manner that allows for the establishment of healthy riparian vegetation. Streams with functioning riparian plant communities produce more suitable food for rearing juvenile steelhead. In turn, steelhead juveniles that acquire adequate food to survive become adults, those that do not die. Increased survival of MCR steelhead at the juvenile stage is needed to improve population abundance and productivity for populations that are not meeting the recovery criteria. Removal of streamside vegetation through wild horse use or their management activities may result in a slight decrease in the amount of food available to juvenile steelhead. However, managing horses in a manner that allows for the development of functioning riparian plant community will enable the riparian community to increase the amount food available in the long term.

The MNF proposes a number of wild horse management practices to minimize the amount of time wild horse trapping, holding and hauling activities occur in or near riparian areas. The MNF's proposed AML (50-140 horses, averaging 100 horses) management goal will ensure minimization of any riparian impacts due to wild horse activity in and around streams.

Additionally, as a part of their livestock grazing program, the MNF has fenced many streams, wetlands and springs to exclude cattle. These exclusion fences also tend to direct wild horses in their movement or watering habits. Implementation of these practices will allow for the development of a healthy riparian plant community in streams that are recovering and

maintenance of a healthy plant community in streams with properly functioning riparian areas. Over time, as riparian plant communities recover and the amount of food available to juvenile MCR steelhead should increase.

In summary, the incidental removal of streamside vegetation through wild horse activities and the resulting introduction of fine sediment will result in a small decrease in the amount of food available to juvenile MCR steelhead. This small reduction in food availability is not significant enough to reduce or prevent the increase of MCR steelhead abundance or productivity at the population scale. In the long term, the management measures proposed by the MNF will allow for development of functioning riparian plant communities which in turn will increase the amount of food available for juvenile steelhead.

Large Woody Debris

Large woody debris is a key component of steelhead freshwater habitat (Spence *et al.* 1996). The BA states that in streams within the action area, large wood is usually provided by fallen conifers. The proposed action will have no effect on conifer recruitment. However, in some areas where hardwoods—particularly black cottonwood and quaking aspen—play an important role in riparian species composition, ungulate browsing can delay future large wood recruitment by limiting sapling regeneration and large tree recruitment. Wild horses will not have any significant impact to the recruitment of woody debris by either their actions, nor by the management activities required to survey, gather, hold, or transport wild horse in and out of the Territory. This is because wild horses tend to spend little time browsing on shrubs in riparian areas as explained in the description of their behavior, earlier. Similarly, MNF riparian survey data taken in the Murderers Creek allotments do not indicate that there is any over use of riparian woody vegetation by wild horses.

Nutrients

Unlike livestock which distribute themselves and their defecations more uniformly across the landscape, wild horses tend to concentrate their defecations in dung posts and stud piles as means of marking their concentration use area. The deposition of nutrients in riparian areas increases the likelihood that elements such as nitrogen and phosphorous will enter the stream. Increased nutrients from wild horse waste will likely increase stream productivity for a short distance downstream from the source. It is anticipated that wild horse defecations have a very minor potential to negatively impact water quality, but those impacts are too small to be meaningfully measured.

The MNF proposes a maximum herd size sufficient to reduce the amount of animals with access to riparian areas throughout the action area. When considered collectively, these measures will limit the amount of waste wild horses deposit in streams or riparian areas of the Territory. Any resulting effects on water chemistry will be so small that they could not be meaningfully detected.

Water Quantity

Riparian vegetation has been linked to the water-holding capacity of streamside aquifers (Platts 1991). As riparian vegetation is removed by herbivores grazing and streamside soils are compacted by their movement, the ability of areas to retain water can decrease.

Evapotranspiration and infiltration decrease and hasten surface runoff, resulting in a more rapid hydrologic response of streams to rainfall. When this occurs, high flows in the spring tend to increase in volume, leading to bank damage and erosion. Summer and fall base flows are decreased, often resulting in flows that are insufficient to provide suitable rearing habitat for juvenile salmonids. If aquifers lose their capacity to hold and slowly deliver water to the stream, differences between peak and base discharge rates increase dramatically (EPA 1993). Some streams that typically flowed perennially may experience periods of no flow in the summer or fall. Li *et al.* (1994) found that streamflow in a heavily grazed eastern Oregon stream became intermittent during the summer, while a nearby, well-vegetated reference stream in a similar-sized watershed had permanent flows. They suggested that the difference in flow regimes was due to diminished interaction between the stream and floodplain, with resultant lowering of the water table.

The MNF has presented information regarding historic range management activities in the action area (including livestock management activities), on channel and bank features such as bank stability, undercut banks and width to depth ratio, as well as impacts to shrub recruitment and green line plant vigor, have likely affected peak and base flows on some streams.

Maintaining an appropriate wild horse population size at AML will help minimize soil compaction and potential changes in peak/base flow. The requirements regarding location of wild horse gathering and holding activities, and transportation methods, will minimize activities near riparian areas. This will avoid soil compaction and protect water-holding capacity of riparian soils. If soil perturbation in riparian areas is properly controlled, natural freeze-thaw cycles and the natural action of plant roots will alleviate soil compaction. Although there may be some minuscule effects to water quantity in the short term, riparian function and water holding capacity is expected to improve in the long term under the proposed wild horse management plan. NMFS believes that, for this proposed action, the effect of wild horses on water quantity will be so slight as to be practically undetectable.

2.4.1.3 Effects on MCR Steelhead Critical Habitat

The effects of the proposed action on MCR steelhead critical habitat are described below. While framed with regard to species rather than PCEs, the discussion of the effects of the proposed action on the various components of steelhead habitat in Section 2.4.1.2, above, is also applicable here.

Freshwater spawning sites

Freshwater spawning sites require water quantity and quality conditions and substrate supporting spawning, incubation and larval development. These features are essential to conservation because without them the MCR steelhead cannot successfully spawn and produce offspring.

Water quantity— As described earlier, when vegetation is removed by wild horses and streamside soils are compacted by their movement, the ability of riparian areas to retain water decreases. The proposed management of ensuring a proper horse herd size can reduce the amount of time horses remain in riparian areas, as their tendency is to be in uplands and enter riparian areas only for daily water. If the horse population having access to riparian areas is properly controlled as

proposed, natural freeze-thaw cycles and the natural action of plant roots will alleviate soil compaction. Although there may be some minor effects to the water quantity PCE in the short term, riparian function and water holding capacity is expected to improve in the long term under the proposed horse management.

Water quality– The effects of the proposed action on water quality (temperature, turbidity, and nutrients) are thoroughly described in the previous section. In summary, wild horses and any associated horse gathering, holding, or transportation activities in or near riparian areas will result in short pulses of turbidity, and possible deposition of wild horse waste in riparian areas and streams. The application of the full suite requirements for the project elements within the Wild Horse Management Plan will ensure that the effects to the water quality PCE remain minor. Over time, as riparian conditions improve, stream temperatures are expected to decrease. As streambank condition improves over time, the amount of turbidity created when wild horse access streambanks will also decrease.

Substrate– Wild horses and the use of vehicles on and off roads can expose bare soil or generate fine sediments which may enter streams. As described earlier, the proposed action will result in a small amount of fine sediment entering streams. This fine sediment can lead to greater stream substrate embeddedness and a general decrease in habitat quality for MCR steelhead. Maintaining proper horse herd size known to result in minimal impacts to riparian areas in the Territory, in combination with the other management directives for wild horse gathering, holding, and transporting intended to reduce the amount of time wild horses spend in riparian areas will substantially reduce the amount of the fine sediment introduced into streams. The MNF pre-turnout riparian monitoring and evaluations for the MNF Murderers Creek Allotment will help ensure sensitive stream reaches, primarily found in the designated MSRAs, have lower streambank impacts and potential for inputs of fine sediment at these sites. Implementation of the WHMP's management measures will ensure that the effects of the proposed action on the substrate PCE remain minor. As streambank conditions improve over time, the amount of fine sediment created when wild horses access streambanks will decrease.

Freshwater rearing sites

Freshwater rearing sites require: (1) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; (2) Water quality; (3) Forage supporting juvenile development; and (4) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. These features are essential to conservation because without them, juvenile steelhead cannot access and use the areas needed to forage, grow, and develop behaviors (*e.g.*, predator avoidance, competition) that help ensure their survival.

Water quantity–As described earlier, when vegetation is removed by wild horses and streamside soils are compacted by their movement, the ability of riparian areas to retain water decreases. The proposed management of ensuring a proper horse herd size can reduce the amount of time horses remain in riparian areas, as their tendency is to be in uplands and enter riparian areas only for daily water. If the horse population having access to riparian areas is properly controlled as proposed, natural freeze-thaw cycles and the natural action of plant roots will alleviate soil compaction. Although there may be some minor effects to the water quantity PCE in the short

term, riparian function and water holding capacity is expected to improve in the long term under the proposed wild horse management.

Floodplain connectivity – Improperly managed wild horse population numbers can result in removal of riparian vegetation and damage streambanks. Without vegetation to slow water velocities, hold the soil, and retain moisture, flooding can cause more erosion of streambanks; streams can become wider and shallower, and in some cases downcut. The application of the wild horse management measures will ensure that adequate riparian vegetation will be maintained along streambanks to prevent streambank erosion. Any effects to the floodplain connectivity PCE will be minor. Over time, streams that are currently disconnected from their floodplains will be able to reestablish connectivity as riparian conditions improve. It should be noted however that it can take decades for stream bed elevation to increase enough to reestablish connectivity in streams that are significantly incised.

Water quality – The effects of the proposed action on water quality (temperature, turbidity, and nutrients) are thoroughly described in the previous section. In summary, wild horses and any associated horse gathering, holding, or transportation activities in or near riparian areas will result in short pulses of turbidity, and possible deposition of wild horse waste in riparian areas and streams. The implementation of the project elements within the Wild Horse Management Plan will ensure that the effects to the water quality PCE remain minor. Over time, as riparian conditions improve, stream temperatures are expected to decrease. As streambank condition improves over time, the amount of turbidity created when wild horse access streambanks will also decrease.

Forage – As described earlier, wild horses can reduce the amount of terrestrial and aquatic insect prey available to juvenile MCR steelhead. This reduction is caused by impacting or removing streamside vegetation or through the introduction of fine sediment into streams. The application of the wild horse management measures limits the amount of vegetation that will be removed from riparian areas and reduces the amount of time horses spend in riparian areas. The implementation of the wild horse management measures will ensure that any effects to the forage PCE will remain minor. In the long term, the strategy contained in the WHMP will allow for development of functioning riparian plant communities which in turn will increase the amount of food available for juvenile steelhead.

Natural cover – MCR steelhead use various stream features such as undercut streambanks, large woody debris, boulders, and overhanging vegetation to provide cover. As described earlier, the removal of riparian vegetation can reduce overhead cover. Streambank alteration by wild horses traversing waterways or coming to drink has the potential to eliminate undercut banks. The introduction of fine sediments can increase substrate embeddedness, reducing the number of hiding places between cobbles and boulders. The application of the wild horse management measures will limit the amount of vegetation that is removed from riparian areas and reduce the amount of time and numbers of horses in riparian areas. The implementation of the wild horse management measures will ensure that any effects to the natural cover PCE will remain minor. In the long term, the WHMP strategy proposed by the MNF will allow for development of functioning riparian areas and more complex stream habitat which in turn will increase the amount of cover available to MCR steelhead.

Freshwater migration corridors

Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks support juvenile and adult mobility and survival. These features are essential to conservation because without them juveniles cannot use the variety of habitats that allow them to avoid high flows, avoid predators, successfully compete, begin the behavioral and physiological changes needed for life in the ocean, and reach the ocean in a timely manner. Similarly, these features are essential for adults because they allow fish in a non-feeding condition to successfully swim upstream, avoid predators, and reach spawning areas on limited energy stores.

Obstruction – The proposed action will not create any obstructions or block fish passage in any way.

Water quantity—As described earlier, when vegetation is removed by wild horses and streamside soils are compacted by their movement, the ability of riparian areas to retain water decreases. The proposed management of ensuring a proper horse herd size can reduce the amount of time horses remain in riparian areas, as their tendency is to be in uplands and enter riparian areas only for daily water. If the horse population having access to riparian areas is properly controlled as proposed, natural freeze-thaw cycles and the natural action of plant roots will alleviate soil compaction. Although there may be some minor effects to the water quantity PCE in the short term, riparian function and water holding capacity is expected to improve in the long term under the proposed wild horse management.

Water quality – The effects of the proposed action on water quality (temperature, turbidity, and nutrients) are thoroughly described in the previous section. In summary, wild horses and any associated horse gathering, holding, or transportation activities in or near riparian areas will result in short pulses of turbidity, and possible deposition of wild horse waste in riparian areas and streams. The application of the project elements within the Wild Horse Management Plan will ensure that the effects to the water quality PCE remain minor. Over time, as riparian conditions improve, stream temperatures are expected to decrease. As streambank condition improves over time, the amount of turbidity created when wild horse access streambanks will also decrease.

Natural cover – MCR steelhead use various stream features such as undercut streambanks, large woody debris, boulders, and overhanging vegetation to provide cover. As described earlier, the removal of riparian vegetation can reduce overhead cover. Streambank alteration by wild horses traversing waterways or coming to drink can eliminate undercut banks and improperly managed grazing can suppress the recruitment of large woody debris. The introduction of fine sediments can increase substrate embeddedness, reducing the number of hiding places between cobbles and boulders. The application of the wild horse management measures will limit the amount of vegetation that is removed from riparian areas and reduce the amount of time and numbers of horses in riparian areas. The implementation of the wild horse management measures will ensure that any effects to the natural cover PCE will remain minor. In the long term, the WHMP strategy proposed by the MNF will allow for development of functioning riparian areas and more

complex stream habitat which in turn will increase the amount of cover available to MCR steelhead.

2.4.2 Murderers Creek Wild Horse Territory-Specific Effects on SFJD Population

Effects from wild horses within the action area of the Murderers Creek Territory and adjacent use wild horse area are likely to be mainly limited to 5.85 miles of MCR steelhead spawning and rearing habitat. Table 3 presents the streams with critical habitat that adjoin or contained within MNF-identified high and medium concentration use areas for wild horses within the action area. Effects to critical habitat and MCR steelhead of the SFJD population in the identified streams are expected to be consistent with the general effects described in Sections 2.4.1.1, and 2.4.1.2. To the extent where there are possible riparian impacts outside of these documented concentration use areas, they are likely to be small and short-lived, and have minimal impacts on MCR steelhead and their critical habitat and associated PCEs, given the MNF's ability to achieve AML as well as their plan to maintain the herd at the lower end of AML.

Effects on SFJD Population of MCR Steelhead. The effects of the proposed action for the Murderers Creek Territory on MCR steelhead are described below. As noted above, wild horse access to and use of MCR steelhead habitat is limited or of short duration on much of the Territory, which will further minimize effects to steelhead.

Direct Effects to Steelhead

Redds. Wild horses will have access to spawning habitat during the spawning period; however, it is unlikely wild horses will trample a redd as described in Section 2.4.1.1.

Adults. Wild horses can have access to spawning habitat during the spawning period; some interference with spawning behavior is possible, but unlikely to be measurable or above background levels for other large ungulate interactions.

Juveniles. Wild horses will have access to streams during times of juvenile rearing and effects are anticipated as described in Section 2.4.1.1.

Habitat Effects on Steelhead

The effects of the proposed action on MCR steelhead from impacts to riparian habitat identified above will be as described in Section 2.4.1.2.

Over time, it is likely that riparian plant communities in the Murderers Creek Territory and adjacent use area will improve, leading to improvements in stream habitat quality. Although the proposed action will result in a small amount of fine sediment entering streams, and some individual MCR steelhead will experience the adverse effects associated with fine sediment inputs, this will not appreciably reduce or prevent the increase of population-scale abundance or productivity. Although sediment from wild horse related activities will result in a small decrease in the amount of food available to juvenile MCR steelhead, this small reduction in food availability is not significant enough to reduce or prevent the increase of MCR steelhead abundance or productivity at the population scale. The minor water quality effects caused by wild horse waste will result in negligible effects on MCR steelhead. Although there may be some

minor effects to water quantity in the short term, riparian function and water holding capacity is expected to improve in the long term under the proposed wild horse management plan. When all aspects of the MNF's proposed WHMP are considered collectively, habitat quality should improve, leading to increased survival of juvenile MCR steelhead in the Murderers Creek Territory and adjacent use area. This in turn will eventually lead to improvements in the SFJD population abundance and productivity.

2.5 Cumulative Effects

'Cumulative effects' are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Cumulative effects that reduce the ability of a listed species to meet its biological requirements may increase the likelihood that the proposed action will result in jeopardy to that listed species or in destruction or adverse modification of a designated critical habitat.

Between 1990 and 2000, the population of Grant County increased by 1.0%. However, between 2000 and 2010, the population of Grant County is estimated to have decreased by 6.2%. Based on these figures it is difficult to determine whether the population will continue to decrease, level out, or increase again. However, since the most recent trend is an estimated decrease in population, NMFS assumes that the population will remain stable or decrease over the remaining 15 years of the plan (through 2027). Future private and state actions will continue within the action area at approximately the same level at which they are occurring now since the population will likely not increase. These actions are described in the environmental baseline section above and cumulative effects section of the BA. As the human population in the action area remains somewhat constant, demand for agricultural, commercial, or residential development, and recreation will also remain somewhat constant.

The ODFW might choose to manage elk or deer populations differently in the future by further restricting harvest through hunting regulations, but NMFS has no information that ODFW intends to do this within the life of this consultation, so elk and deer populations are assumed to remain fairly stable into the future. The effects of elk and deer in the action area are described in section 2.3 above and in the environmental baseline of the BA. The effects on MCR steelhead and their habitat caused by these ungulates are potentially similar to that of the larger wild horses, however, given the broad dispersal of elk and deer across the area, their possible impacts to MCR steelhead or designated critical habitat are considered minor and incorporated into the baseline of the area.

There is a history of some livestock trespassing onto Federal land from adjacent private land in the action area. The MNF has largely been successful addressing these issues. However, given the abundance of landowners grazing cattle adjacent to MNF land, it is likely that trespass will occur in the future at similar levels. Trespass is likely to cause some very minor effects to MCR steelhead and their habitat. Those effects will be similar to effects of the proposed action and the effects of authorized livestock grazing addressed in our 2012 opinion on the MNF's livestock grazing program. Due to the infrequent occurrence and minor intensity of these effects they will

not impact population abundance or productivity, or the rate at which riparian and stream habitat are likely to recover.

Because the action area is primarily Federal land, population growth and development are not likely to cause measurable effects to MCR steelhead or their habitat within the action area. Recreational activities have been occurring in the action area for decades and are expected to continue at similar levels in the future. Effects from recreation include minor human disturbance of riparian areas due to camping and hunting, and other non-consumptive activities and occasional incidental catch of MCR steelhead juveniles during recreational fishing for trout.

Therefore, the quality of the habitat within the action area is likely to steadily increase, with natural recovery from the historic, less conservative land management. NMFS is not aware of any additional specific future non-Federal activities within the action area that would cause effects to MCR steelhead or their designated critical habitat. Thus, NMFS assumes that the described future private and state actions will continue within the action area, at roughly the same level. As stated above, due to MNF efforts, NMFS does not anticipate livestock trespassing will impede continuing habitat recovery across the Territory. The cumulative effects in the action area are not expected to further reduce the quality and function of designated MCR steelhead critical habitat, or the productivity, spatial distribution, or abundance of MCR steelhead populations.

2.6 Integration and Synthesis

The Integration and Synthesis Section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we will add the effects of the action (Section 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5) to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species and critical habitat (Section 2.2).

The MCR steelhead population occurring within the action area is the SFJD population. The MPG-level recovery criteria from the MCR Steelhead Recovery Plan (NMFS 2009) require that the LJD, the NFJD, and either the MFJD or the UJD populations should be viable. One of these populations should be highly viable. The SFJD population must be at a maintained viability status (NMFS 2009). The MFJD and UJD populations do not meet the recovery plan viability criteria, while the NFJD population is "highly viable." The SFJD population is currently at maintained status (Ford 2011) and must remain at this rating, or improve, for the John Day MPG-level recovery criteria to be met. The MFJD and UJD populations are not currently viable, and one of these populations must reach viable status before the MPG-level criteria can be met.

As described in Section 2.4.1.1, the proposed action of managing the wild horse herd at AML (50-140 animals, averaging 100 horses) is likely to result in some disturbance of rearing juvenile steelhead. Disruptions to essential juvenile behaviors of feeding and sheltering are likely to be

limited to stream reaches where wild horses can easily approach or enter the water. Disruptions are not likely to occur in streams that are less accessible due to the occurrence of dense woody vegetation around the streambanks or the presence of large amounts of down woody debris near streams. The implementation of a variety of conservation measures associated with the MNF's and PD's wild horse management strategy, including extensive fencing in MSRAs and other areas, and providing upland water sources, will help minimize the amount of time wild horses spend in riparian areas and the frequency of disruption to juvenile MCR steelhead. Similarly, managing the wild horse population within the AML will help minimize the amount of time horses use riparian areas as well as reduce the potential for horses to disturb juvenile or adult steelhead. Disturbance of adult MCR steelhead behaviors is not expected to be measurable above background levels. The disruptions to essential behaviors of juvenile MCR steelhead caused by the proposed action will not be significant enough to appreciably reduce or prevent the increase of abundance or productivity of the population addressed by this consultation.

As described in Section 2.4.1.1, the proposed action presents the very slight potential for wild horses to occasionally disturb MCR steelhead redds. Because of the proposed herd management to AML levels, averaging 100 wild horses over time, the other wild horse management measures, and the limited stream miles contained in the few locations where the wild horse concentration use areas intersect with critical habitat and where any interaction is most likely to occur, NMFS does not expect any redd trampling to be caused by wild horses.

The potential impact of the proposed action on MCR steelhead habitat is described in Section 2.4.1.2. Although the proposed action will result in some impacts to MCR steelhead habitat, such as minor streambank alteration, and introduction of fine sediments into streams, these impacts will be minimized by the management measures proposed by the MNF. In particular, the population census monitoring and proposed gathering schedule to keep the herd within the AML, averaging 100 animals over time will reduce the overall impacts of wild horses on riparian areas and stream habitat within the Territory.

The potential impact of the proposed action on MCR steelhead critical habitat is described in Section 2.4.1.3. These impacts include minor streambank alteration, minor introduction of fine sediments into streams, a small reduction in forage, and a minor reduction in overhead cover. These impacts will be minimized by the management measures proposed by the MNF.

The information presented in the environmental baseline section (Section 2.3) indicates that many streams within the action areas are in a degraded condition due to past land management practices. Recent information from effectiveness monitoring efforts indicates that some attributes of stream habitat quality are improving while habitat quality in some streams remains static. Information presented in the BAs and environmental baseline section also indicates that in some watersheds, certain stream habitat attributes, such as temperature and substrate embeddedness, are highly influenced by watershed road density and legacy effects from past land management practices. In these watersheds, improvements to stream habitat quality may be slow whether the proposed action is carried out or not. Regardless of the current condition of stream habitat in the action area, the proposed action is expected to allow for improvement of riparian areas over time which will in turn allow for the improvement of stream habitat quality. Over time, the proposed action should allow for the development of habitat conditions capable of supporting a viable

SFJD population of MCR steelhead. The baseline also includes the effects of actions that have undergone ESA section 7 consultation such as the MNF grazing program which was the subject of biological opinion issued in 2012. The effects of the MNF grazing program include redd trampling, minor disturbance of juveniles, streambank alteration, and minor impacts to riparian plant communities.

As noted in Sections 2.2, 2.2.2, and 2.3, climate change is likely to affect MCR steelhead and their habitat in the John Day River basin. Although these effects are expected to be mostly negative, it is difficult to impossible to predict the specific changes that will result from climate change over the remaining term of this consultation (2012-2027). Over the past several years, precipitation levels in the John Day Basin have varied widely,⁵ with high water years producing favorable conditions for MCR steelhead and low water years producing less favorable conditions. This has made it even more difficult to predict how short term changes in climate might affect MCR steelhead and their habitat. NMFS will revisit the environmental baseline and information on climate change in the MNF-scheduled update to the management plan and its associated consultation on the proposed action.

The cumulative effects of state and private actions within the action area are anticipated to continue at approximately the same level that they are now occurring and will cause no discernible change to habitat condition or trend since the action area consists almost exclusively of Federal land.

In summary, the proposed action will result in minor disturbances to juvenile MCR steelhead, but these disturbances will not appreciably reduce or prevent the increase of abundance or productivity of the population addressed by this consultation. The proposed action will cause minor effects to MCR steelhead habitat, but these impacts to habitat will not appreciably reduce or prevent the increase of abundance or productivity of the population addressed by this consultation. The proposed action will have no effect on population spatial structure or diversity. The proposed action affects only a tiny portion of the SFJD population, which has met its required status in order to satisfy the recovery goals. The continued habitat improvement allowed for by the proposed action will help to ensure this population maintains its current status. The proposed action is consistent with a recovery scenario that allows the John Day MPG to reach viable status. This is a critical step toward recovery of the DPS as whole, because all MPGs must be considered viable for the DPS to reach recovery.

The conservation value of critical habitat within the action area varies, but for the most part, conservation value of this habitat is high. The proposed action will have minor effects on the quality and function of critical habitat PCEs as described in Section 2.4.1.3. The management measures proposed by the MNF will ensure that effects to PCEs remain minimal. As improvements to habitat quality accrue over time, critical habitat within the action area will be able to serve its intended conservation role, supporting a viable or 'maintained' population of MCR steelhead.

⁵ See: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/basinsweplots/or/basinplotjohn%20day12.gif>

2.7 Conclusion

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent actions, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of MCR steelhead or to destroy or adversely modify its designated critical habitat.

2.8 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined by the statute as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is defined by regulation to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. For this consultation, we interpret "harass" to mean an intentional or negligent action that has the potential to injure an animal or disrupt its normal behaviors to a point where such behaviors are abandoned or significantly altered.⁶ Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this incidental take statement.

2.8.1 Amount or Extent of Take

The proposed action will result in wild horses entering streams to drink, to cross to the other side, and to graze the streambank. Wild horses will also approach streams and walk beside streams while grazing in riparian areas. Wild horses will be in and near stream reaches at times when the reaches are used by juveniles for rearing and migration.

As described in detail in the effects section of this document, incidental take is reasonably certain to occur when juveniles are startled by wild horses and displaced from preferred locations. Less preferred locations will expose juveniles to greater risk of predation, higher energetic demands to hold position, or reduced foraging success.

Incidental take is also reasonably certain to occur as a result of increased fine sediment inputs to streambeds. As described in detail in the effects section of this document, wild horses adversely affect steelhead habitat in those areas where they access, cross or trail along streams, mostly within the nine identified concentration use areas containing critical habitat, and infrequently

⁶ NMFS has not adopted a regulatory definition of harassment under the ESA. The World English Dictionary defines harass as "to trouble, torment, or confuse by continual persistent attacks, questions, etc." The U.S. Fish and Wildlife Service defines "harass" in its regulations as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). The interpretation we adopt in this consultation is consistent with our understanding of the dictionary definition of harass and is consistent with the Service's interpretation of the term.

elsewhere. Near-channel wild horse activity through the mechanical action of horse hooves alters streambanks and exposes bare soil. Creation of and repeated use of trails removes vegetation and exposes bare soils which are fine sediment sources during periods of surface runoff, or over-bank flows. Fine sediment deposition from horse trails and horse-altered streambanks fills the interstitial spaces between streambed gravels needed for juvenile over-winter cover, invertebrate forage production, and water circulation to oxygenate eggs and pre-emergent fry. When fine sediments fill interstitial spaces between gravels and cobbles, eggs and pre-emergent fry suffocate, juveniles lose over-wintering habitat, and invertebrate animals that juveniles eat become less abundant. This pathway of incidental take is attributed to the slight fine sediment input to streams resulting from wild horse activity as stated above.

Take is unlikely to occur through trampling of redds or startling and displacement of adult steelhead. All other possible pathways of take resulting from the wild horse herd when it is within, or near, AML as described in the effects section above are either too small to be meaningfully measured, or are extremely unlikely to occur.

The number of individual MCR steelhead harmed or harassed by these two pathways, displacement and sedimentation, cannot practically be counted. The individual juvenile steelhead and eggs that will be taken by reduced condition from reduced forage, and suffocated from reduced intergravel dissolved oxygen, are scattered across remote and rugged stream reaches that are practically inaccessible, especially in winter, for observation and collection of small, numerous, and sometimes buried, individual specimens. Any attempt to collect and study juveniles and eggs, to a statistically useful extent, would disturb and injure far more individuals than the wild horses do. So, NMFS provides a quantified and measurable extent of take to serve as a surrogate indicator for the amount of take.

The estimated number of wild horses within the Murderers Creek Territory herd is the best extent of take indicator for both pathways of incidental take because: (1) The number of juvenile steelhead displaced from preferred habitat by being startled by horses will be proportional to horse herd size; (2) the amount of fine sediments from exposed soils and altered streambanks making their way into streambed will increase with increasing herd size; and (3) wild horse population size is periodically estimated by a standardized methodology that is part of the proposed action.

NMFS is certain that implementing the WHMP will cause take of MCR steelhead, and that wild horse population size is the best available extent of take indicator that is proportional to that amount of take. The proposed action includes a defined protocol for estimating wild horse population size and specified procedures for gathering, removing and transporting culled animals. The MNF-PD WHMP has identified situations that may limit their effectiveness at reducing herd size and maintaining AML, and some modest and temporary exceedences of AML are reasonably likely during the term of the proposed action. NMFS anticipated some exceedences in our analysis of effects. Long-lasting exceedences will indicate incidental take in excess of what was contemplated in NMFS' opinion.

The extent of take limitation is:

- Murderers Creek Wild Horse estimated population size of 140 individual animals or fewer at some time within every rolling 24-month period.

This maximum extent of take limitation anticipates possible temporary exceedences of the maximum herd size intended by the action agencies' proposed action. However, management of wild horses is somewhat unpredictable for several reasons, and accidental exceedance of AML is possible. Possible overages within this limitation are anticipated by the above analysis of effects, and will not change our conclusions.

Exceeding this take limitation will trigger the reinitiation provisions of this opinion, and may obviate the section 7(o)(2) exemption to take prohibition. The below indicator is a trigger for reinitiation:

- Murderers Creek wild horse herd estimated population size of 141 individuals or more continuously over the entirety of any 24-month rolling period.

This extent of take indicator represents an effective limitation that, if exceeded, may indicate that the wild horse herd management program has become ineffective in controlling effects to MCR steelhead. The intent of the extent of take limit above is to precisely quantify an unambiguous consultation reinitiation trigger that is appropriate for a fluctuating population of wild free-roaming animals, the number of which cannot be instantly controlled or even counted. Yet the population size is central to our analysis of effects and is the principal management tool of the action agencies.

2.8.2 Effect of the Take

In Section 2.7, NMFS determined that the level of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

2.8.3 Reasonable and Prudent Measures

“Reasonable and prudent measures” are nondiscretionary measures to minimize the impact of the incidental take [16 USC 1536(b)(4)(ii)]. The MNF and PD shall:

1. Minimize incidental take caused by the proposed action by performing certain horse removal actions when wild horse population estimates exceed AML.
2. Implement a program of monitoring and reporting to ensure that the extent of take limitation is not exceeded, and that herd management actions are effective in minimizing the impact of incidental take.

2.8.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the MNF and PD must comply with them in order to implement the reasonable and prudent measures (50 CFR 402.14). The MNF and PD have a continuing duty to monitor the extents of incidental take and must report the progress of the action and its impact on the species as specified in this incidental take statement [50 CFR 402.14(i)]. If the following terms and conditions are not complied with, the protective coverage of section 7(o)(2) will likely lapse.

1. To implement reasonable and prudent measure #1, the MNF and PD shall apply the following measures:
 - a. If the estimated wild horse population, plus 20 percent annual recruitment, will exceed 140 animals in the fall of calendar year 2013 or any subsequent year, conduct horse removal actions to reduce the total estimated population to 140 animals or fewer by the end of that calendar year.
2. To implement reasonable and prudent measure #2 (monitoring and reporting), the MNF and PD shall:
 - a. Whenever the estimated population (inclusive of the census modifier plus annual recruitment) exceeds the AML maximum of 140 animals, conduct a census to determine minimum number of horses that must be gathered to stay within the AML for the coming year.
 - b. Conduct a wild horse census (survey) not less than once in the two-year period, 2013-2014.
 - c. Conduct a wild horse census (survey) not less than once in every three-year period, 2015 and thereafter.
 - d. Conduct a wild horse census survey not less than once per year, calendar year 2015 and thereafter, in any calendar year when the estimated population size is 141 animals or more, and every subsequent year until the estimated population size (inclusive of annual 20 percent recruitment) is 140 animals or fewer.
 - e. Review and update information on the size, number, and distribution of wild horse concentration use areas by the end of calendar year 2015.
 - f. By February 15th of each year, provide NMFS with an annual report to include, at a minimum:
 - i. Current wild horse concentration use map(s) with any updates to Territory delineation.
 - ii. Wild horse population survey data and current population calculations. Include a description of the techniques used and conditions experienced for said survey.
 - iii. Wild horse gathering results, to include resulting update to population estimates.
 - iv. All monitoring data collected on the MNF Murders Creek Allotment prior to livestock turnout in the previous calendar year that assesses riparian condition or measures riparian indicators.

- v. All monitoring data collected in the four PD grazing allotments that overlap the wild horse Territory in the previous calendar year.
- vi. Send the annual report to: NMFS, 3502 Hwy 30, La Grande, OR 97850.

2.9 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). The following conservation recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the Federal action agency:

- MNF and PD should consider funding field research to attain more area-specific information on the wild horse use of the Murderers Creek Territory landscape at various population levels within AML, such as at the 50, 95, and 140 population numbers, and incorporate this information into future changes to the Murderers Creek WHMP. This assessment should also include updating the information on concentration use areas and how wild horses disperse across the landscape during different seasons of use.
- MNF and PD should research the possibility of improving the statistical accuracy and precision of their horse herd population estimation and population growth projection calculation methods, to include confidence intervals.

This opinion is based upon the best scientific and commercial data available. Subsequent consultations with the MNF and PD will be more effective in conserving listed fishes and improving wild horse management if a more comprehensive body of relevant science is available in the future.

Please notify NMFS if the Federal action agencies carry out any of these recommendations so that we will be kept informed of actions that are intended to improve the conservation of listed species or their designated critical habitats.

2.10 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

Examples of reinitiation triggers for this consultation would be: new information regarding identified wild horse concentration use areas that shows increased proximity to designated

critical habitat; or the agency action is subsequently modified such that population census for the Murderers Creek Wild Horse Territory is not conducted annually whenever AML is exceeded, or is not conducted at least every 3 years when the estimated population is within AML.

3. MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION

The consultation requirement of section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Adverse effects occur when EFH quality or quantity is reduced by a direct or indirect physical, chemical, or biological alteration of the waters or substrate, or by the loss of (or injury to) benthic organisms, prey species and their habitat, or other ecosystem components. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the MNF and descriptions of EFH for Pacific coast salmon (PFMC 1999) contained in the fishery management plans developed by the Pacific Fishery Management Council (PFMC) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

The proposed action and action area in this opinion is described in the Introduction to this document. This action area includes areas designated as EFH for all life stages of Chinook salmon.

3.2 Adverse Effects on Essential Fish Habitat

Based on information provided by the action agency and the analysis of effects presented in the ESA portion of this document, NMFS concludes that the proposed action will have the following adverse effect on EFH designated for Chinook salmon:

As riparian vegetation is removed by wild horse activity and streamside soils are compacted by hooves, the ability of areas to retain water is decreased. The proposed management of maintaining the wild horse population within AML, and averaging 100 animals over time, can reduce the amount of time wild horses remain in riparian areas. If the wild horse population is properly controlled as proposed, natural freeze-thaw cycles and the natural action of plant roots will alleviate soil compaction. Although there may be some minor effects to water quantity in the short term, riparian function and water holding capacity is expected to improve in the long term under the proposed grazing management.

Wild horse use and movement patterns, as well as use of vehicles on and off roads to conduct trapping or transport activities, can expose bare soil and generate fine sediment that enters streams. The proposed action will result in a small amount of fine sediment entering streams. This fine sediment can lead to greater stream substrate embeddedness and a general decrease in habitat quality for Chinook salmon. Establishing target wild horse population numbers in combination with the other management measures intended to reduce the amount of time wild horses spend in riparian areas will substantially reduce the amount of the fine sediment introduced into streams. As streambank condition improves over time, the amount of fine sediment created when horses impact streambanks will decrease.

An improperly managed wild horse population size can impact riparian vegetation and damage streambanks. Without vegetation to slow water velocities, hold the soil, and retain moisture, flooding can cause more erosion of streambanks; streams can become wider and shallower and in some cases down cut. The application of the wild horse management measures will ensure that adequate riparian vegetation will be maintained along streambanks to prevent streambank erosion. Maintaining wild horse population numbers within AML reduces the amount of streambank damage and will allow banks to stabilize over time.

Wild horses can reduce the amount of terrestrial and aquatic insect prey available to juvenile Chinook salmon. This reduction is caused by the removal of streamside vegetation or through the introduction of fine sediment into streams. The application of the wild horse management measures will limit the amount of vegetation that is removed from riparian areas and reduce the amount of time and numbers of horses in riparian areas. Establishing target wild horse population numbers reduces the amount of the fine sediment introduced into streams. The implementation of these management measures will ensure that any effects to forage will remain minor.

Chinook salmon use various stream features such as undercut streambanks, large woody debris, boulders, and overhanging vegetation to provide cover. The removal of riparian vegetation can reduce overhead cover. Streambank alteration by horses can reduce undercut banks. The introduction of fine sediments can increase substrate embeddedness, reducing the number of hiding places between cobbles and boulders. The application of the wild horse management measures limits the amount of vegetation that can be removed from riparian areas and reduces the amount of time horses spend in riparian areas. Establishing target wild horse population numbers reduces amount of damage to streambanks. The implementation of these management measures will ensure that any effects to natural cover will remain minor. In the long term, the horse management strategy proposed by the MNF and PD will allow for development of functioning riparian areas and more complex stream habitat which in turn will increase the amount of cover available to Chinook salmon.

3.3 Essential Fish Habitat Conservation Recommendations

NMFS expects that fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in Section 3.2 above, approximately 78 acres of designated EFH for Pacific coast salmon:

- MNF and PD should consider funding field research to attain more area-specific information on the wild horse use of the Murderers Creek Territory landscape at various population levels within AML, such as at the 50, 95, and 140 population numbers, and incorporate this information into future changes to the Murderers Creek WHMP. This assessment should also include updating the information on concentration use areas and how wild horses disperse across the landscape during different seasons of use.
- MNF and PD should research the possibility of improving the statistical accuracy and precision of their horse herd population estimation and population growth projection calculation methods, to include confidence intervals.

These conservation recommendations are the same as those provided in Section 2.9, above.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the Federal action agency must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the Federal agency have agreed to use alternative time frames for the Federal agency response. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5 Supplemental Consultation

The MNF and PD must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The DQA specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components,

documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended user of this opinion is the MNF and PD. Individual copies of this opinion were provided to the MNF. This opinion will be posted on the NMFS Northwest Region web site (<http://www.nwr.noaa.gov>). The format and naming adheres to conventional standards for style.

4.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3 Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01, et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References Section. The analyses in this opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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Appendix: Response to Comments

Murderers Creek Wild Horse Management Plan Draft Biological Opinion
Malheur National Forest BMRD
December 12, 2012^{7, 8}

⁷ Further communication from MNF on January 2, 2013, updated the horse gather numbers displayed in the table below for response to comment 1c. The up to date January 2, 2013 values are incorporated into the consultation analysis above.

⁸ Late in the process of finalizing the biological opinion, on January 28, 2013, NMFS received a direct mailing of photos and information from Lauren Stout. This same package was delivered to MNF staff, and discussed, at a January 9 meeting. MNF and NMFS had a conference call on January 22nd at which this information was discussed. This information is addressed in the response to comments appendix.

Response to Comments
Murderers Creek Wild Horse Management Plan Draft Biological Opinion
Malheur National Forest BMRD

December 12, 2012

On October 15, 2012, the National Marine Fisheries Service (NMFS) made available a pre-decisional draft biological opinion (BO) regarding the Murderers Creek Wild Horse Territory / Herd Management Area Management Plan on the Malheur National Forest (MNF) and Bureau of Land Management Prineville District (PD) to the MNF, PD, and Loren and Piper Stout for review and comment. The Stouts were provided an opportunity to review the draft BO as part of a settlement agreement regarding their claim against the MNF for failure to consult on the 2007 Murderers Creek Wild Horse Territory/Herd Management Area Management Plan.

Comments were received from Loren & Piper Stout and their representatives Western Resources Legal Center and Dunn Carney dated November 6, 2012 (referred to as Stout Comments). NMFS also received comments from the MNF and PD on November 14, 2012. Representatives from the MNF, PD, and NMFS met in Baker City, OR November 28 to review the comments, exchange information, determine whether adjustments to the BA or BO may be appropriate, and provide preliminary responses to comments received. Agency internal input on the preliminary responses were subsequently received and considered in this response document.

Attached to and referenced in the November 6 letter received from Loren & Piper Stout, Western Resources Legal Center and Dunn Carney were photographs, prior court declarations, and a November 5, 2012 letter from the Stouts. This additional information was considered in our responses as supporting background information to their primary comments within the November 6 letter. Additionally the MNF has responded to declarations filed in Stout v. USFS through the government's filings in support of its Cross-Motion for Partial Summary Judgment in Stouts v. U.S. Forest Service, (D. Or. 09-152-HA) (Appendix A). This included declarations from the MNF expert witness Timothy Burton refuting the methods and measurements taken by Patricia Larson and Peggy Browne. Mr. Burton found that "the numbers of samples collected by plaintiffs' declarants [Larson and Browne] were deficient and not according to the MIM protocol" (Page 5 - DECLARATION OF TIMOTHY A. BURTON Appendix A2). He also found that "the DMAs used by plaintiffs' declarants were also not adequate in length. Page 6-DECLARATION OF TIMOTHY A. BURTON (Appendix A2)

The MNF has found that the photographs submitted by commenters are not representative of the greater landscape nor the actual conditions of which the pictures are said to depict. The locations of the photographs appear to be random and selectively chosen. As such the photographs are

only representative of a fraction of the stream reach in which taken and not the stream condition as a whole. Several of the included photographs are of a water gap that by nature receives heavy concentrated use.

The agencies emphasize that the action under consultation is the 2007 Murderers Creek Wild Horse Territory/Herd Management Plan. This approved plan analyzed the effects of wild horses at AML. The consultation is on implementing the plan at AML. It should be noted that the MNF and PD are initiating a new analysis for the Murderers Creek Wild Horse Management Plan, within which many of the following comments that are outside the scope of this consultation may be addressed.

Stout Comments

Comment 1a: The proposed action stated that all pastures would be monitored prior to livestock turnout, and that if endpoint indicators are at or within proximity to allowable use, cattle will not be allowed to turnout or will be moved to the next pasture. This monitoring was included in the MNF proposed action for 2012-2016 livestock grazing in the Murderers Creek Allotment (MCA). The commenter suggested that the MNF did not measure horse impacts prior to livestock turnout in the MCA in 2012, and thus cannot be relied upon to implement the Herd Management Plan proposed action.

Response: Pre-season monitoring is not a component of this proposed action but rather a component of the Murderers Creek Allotment Livestock Grazing proposed action, and therefore was considered in the BA for this proposed action as part of the environmental baseline. Pre-season monitoring was conducted for all pastures where livestock were scheduled for turnout in 2012. Pre-season monitoring occurred on June 21, 2012 for the Timber Mountain pasture, July 3 for Deer Creek, Frenchy Butte, and John Young Meadows pastures (Loren Stout and their consultant Patricia Larson were present), and July 30 for the Blue Ridge and Lucera pastures. The remaining pastures within the allotment were not scheduled for grazing in 2012, and therefore pre-season monitoring was not required nor conducted.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 1b: The commenter suggests the proposed action described in the draft BO miss-stated that water troughs, springs, and ponds are maintained by permittees for not only livestock, but also wildlife and wild horses. The commenter pointed out that these features are maintained by permittees for livestock only, and only in years when turnout occurs. It is possible that

turnout, and thus water feature maintenance, may not occur every year. Thus NMFS should not consider these features to be part of the proposed action.

Response: Maintenance of troughs, springs, and ponds is not a component of this proposed action but rather a component of the Murderers Creek Allotment Livestock Grazing proposed action, and therefore was considered in the BA for this proposed action as part of the environmental baseline. The draft BO states, as in the BA, that troughs, springs, and ponds are maintained by grazing permittees to provide off-stream water for livestock, wildlife, and wild horses. Permittees maintain these features for livestock, and wildlife and wild horses may also benefit from these improvements. The analysis within the BA and BO does not hinge upon whether or not water developments are maintained annually. Maintenance on an annual basis is not necessary for many developments to continue functioning. The possibility that water development maintenance may not occur in all pastures in all years does not negate the fact that they are part of the landscape and therefore, relevant for consideration in the draft BO.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 1c: The commenter suggests that there are major disparities with a table in the draft BO regarding wild horse gathers and population estimates; the commenter in Footnote 1 requests that the agencies verify that the 2012 census was not mistakenly represented as the 2011 census; and that NMFS must receive an explanation of those discrepancies.

Response: The MNF acknowledges errors in the table initially represented in the BA. The following table is provided to NMFS for inclusion in the final BO. The included table is presented for the purposes of this consultation.

Fiscal Year	Number of Horses Removed	Resulting Population Estimate	MNF Comments
2013	182*	75	*Includes 40 horses removed in September 2012. . Current population estimate doesn't include recruitment which will be applied in the spring of 2013.
2012	83	257	2012 census counted 161 animals. Applied correction factor of 7.5-32% undercount as described in Lubow and Ranson (2009) puts population estimate at 173-213. Recruitment of 20% brings total to 257.

Fiscal Year	Number of Horses Removed	Resulting Population Estimate	MNF Comments
2011	60	238	2011 census counted 132 animals w/an estimate of 198 total. Add the 20% recruitment to reach the estimated pop. of 238.
2010	46	231	Estimate based upon 2009 census and 2009/2010 removals.
2009	77	230	115 horses observed, used 100% correction factor, based on viewing conditions
2008	136	460	
2006	0	430	conducted on the ground census from July to September 2006
2005	99	90	AML and Est. Pop. is 75% of total with BLM.
2004	55	193	
2003	6	220	
2002	0	193	
2001	53	165	Estimates
2000	0	180	Estimates

The MNF verifies for Footnote 1 that the 2011 census is indeed the 2011 census.

The MNF emphasizes that the population estimate is not simply a count of horses, and that the estimates will continue to improve as estimation methods are refined. In 2006 a ground census was conducted. In 2009 survey protocols changed to aerial census methodology. In 2012 the correction factor described in Lubow and Ransom (2009) was applied to the direct wild horse count, and is expected to provide a more accurate estimate than those of previous years (which relied on professional experience of the Oregon/Washington BLM Wild Horse State Lead).

The revised table replaces the table provided in the original BA, and the comment response team recommends the revised table be incorporated into the final BO.

Comment 2a: The commenter suggests that the MNF in the proposed action does not commit to using the MIM protocol to monitor wild horse use.

Response: We confirm that the MNF is not committing to using the MIM protocol to analyze wild horse use specifically. Annual monitoring of livestock use, using the MIM protocol, where turnout is scheduled, incorporates impacts of wildlife and wild horses as well. The proposed action centers around managing for AML, thus monitoring of the proposed action focuses on population numbers. As stated in Timothy Burton's Third Declaration at ¶10 "Application

[MIM protocol] to ‘other activities’ is allowed, but limited to demonstrating measurable trends in condition.”

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 2b: The commenter suggests that aside from monitoring focused on livestock grazing on the MCA, the only monitoring that is occurring regarding horse impacts specifically, would be occurring on 5-year intervals; the commenter suggests that in light of the goal of no annual carry over effects for livestock grazing, NMFS would be challenged to issue a No Jeopardy BO on an action which does not include annual monitoring.

Response: The five-year interval monitoring they refer to, we assume is the PIBO trend monitoring. This trend data augments the annual implementation monitoring of livestock grazing. Per response 2a monitoring of the proposed action will focus on population numbers and once AML is achieved monitoring will be conducted on a minimum 2 to 3 year interval depending upon horse gather and census results.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 2c: The commenter suggests that NMFS should not agree to a Proposed Action that does not include annual monitoring of horse impacts on steelhead critical habitat.

Response: The proposed action, which is the 2007 Murderers Creek Wild Horse Territory / Herd Management Area Plan, does not include annual monitoring of horse impacts. The ESA consultation is based on the action agencies’ proposed action.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 3a: The commenter suggests that Figure 3 of the draft BO (figure 7 of the BA), shows little horse use of critical habitat, is not cited in the draft BO for support of depicted concentration areas, and does not indicate what time of year it is meant to depict.

Response: The map represents high and moderate use areas that were observed during the 2006 Census (conducted June 26 – September 23). Observations of current habitat use throughout the year are generally consistent with these mapped areas; this is supported by the MNF most recent census flight conducted in March 2012. Horse population numbers greatly exceeded AML at the

time of the 2006 census (n=436), as such the map would over-represent size and extent of concentration areas (2012 Population estimate = 257). The BA and draft BO indicate that these are areas where impacts from wild horses are more likely to be realized. The draft BO analyzed the effects of horse use within the concentrated use areas, as it relates to critical habitat, as well as areas not depicted in the map. The BA page 70 indicates that the source of the map is the 2007 Management Plan “The map was created following the 2006 wild horse census – areas of high and moderately high concentrations and significant wild horse impacts were identified. This map will be used to help plan future gather operations.”

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 3b: The commenter suggests that there is significant information regarding wild horse impacts on critical habitat within the MCA (Horse Territory) that was not discussed or included in the draft BO, leading the commenter to question whether this information was considered. This information includes documentation of horse use in riparian areas/steelhead critical habitat throughout the year in the MCA, lack of Proper Functioning Condition (PFC) analysis in the draft BO which found wild horses responsible for preventing PFC on certain streams within the MCA, and lack of reference to court records submitted by the Stouts and their consultants and representatives.

Response: The BA and draft BO analyzed effects to steelhead critical habitat at AML. The information presented in the BA as baseline was rolled forward for consideration in the analysis of the draft BO and was supplemented with current monitoring information. This information was included in the baseline section of both the BA and draft BO because it documented effects of the horse population above AML. The BA (page 65-66) included a summary of the PFC assessments conducted in 2004. During this time the wild horse population exceeded AML. The impacts observed during the PFC assessment are not anticipated to occur with a wild horse population at AML. The court submittals detailed findings of impacts of wild horse use on steelhead critical habitat within the MCA when horse numbers were significantly above AML. The information provided by the commenter and the PFC assessments referenced in their comment documented impacts related to wild horses at population levels exceeding AML. We do not anticipate these impacts at AML.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 3c: The commenter suggests that the draft BO inadequately addresses wild horse access to steelhead Critical Habitat throughout the year when compared with livestock which are

present for a portion of the year and managed to remain outside of riparian areas. The commenter also asserts that fences have proven to be of limited value in managing horse movements.

Response: The BA acknowledges that wild horses have access to riparian areas and steelhead critical habitat throughout the year, and provides an analysis of such as part of Habitat Project Element 1 “**Use of territory and adjacent lands:** Existence of free-roaming wild horses within the Territory and adjacent lands year-round at an AML of 50-140 horses, averaging 100 horses. Wild horses consume vegetation, drink water, urinate and defecate, and migrate daily and seasonally.” This information is analyzed in the draft BO as well. As documented most recently in the MNF Horse Mountain Exclosure, South Fork Murderers Creek Inspection (July 23, 2012), and allotment inspection reports, MNF data suggests that fences have proven to be effective in limiting horse use of critical habitat (Appendix B).

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 3d: The commenter suggests that the MNF did not provide a determination that the literature used in the BA regarding horse use is representative of horse use within the Murderers Creek Wild Horse Territory, and that NMFS should not rely on general literature to determine the effects of this wild horse herd.

Response: A thorough literature search was conducted for the analysis included in the BA and draft BO. MNF is unaware of literature specific to the Murderers Creek Wild Horse Territory. The agencies relied upon the best available science to analyze effects of the action on steelhead and their critical habitat within the BA and draft BO, as required by the ESA.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 3e: The commenter suggests that the draft BO considered areas of concentrated wild horse use of 1 – 2 acres, and that some areas have been observed as larger than that described.

Response: The BA (pg. 69) acknowledges that past areas of concentrated wild horse use can range up to 200 acres in the uplands, as reported in the 2008 End of Year Grazing Report. The BO considered this information in the environmental baseline. This extent of concentrated use is not expected to occur when the herd is at AML. Therefore the draft BO focused its analysis on areas of concentrated wild horse use of 1 – 2 acres.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 3f: The commenter suggests that NMFS and the MNF must treat impacts from wild horses with the same sense of urgency as impacts from livestock.

Response: The MNF has acknowledged impacts from wild horses and addressed those impacts with a great sense of urgency which has been demonstrated through successful acquisition of significant funding sources to implement an aggressive horse gather strategy, fencing, and juniper thinning projects intended to reduce wild horse impacts. Information provided in the table in Comment 1c above demonstrates MNFs commitment and significant progress towards achieving AML.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 3g: The commenter suggests that the draft BO largely omits information on the extent of horse impacts on various life stages of steelhead.

Response: The BA and draft BO analyzed direct effects to various life stages of the steelhead, and analyzed indirect impacts on the primary constituent elements of steelhead critical habitat, used as a surrogate for effects to the species.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 4a: The commenter suggests that the BO does not include a discussion of wildlife management and fishing effects to steelhead (first 3 paragraphs of comments).

Response: State Fish and Wildlife management is not within the scope of the proposed action. Wildlife management is addressed in the BA in the cumulative effects section, and in the Environmental Baseline section of the draft BO. The effects of fishing are discussed in the Environmental Baseline section of the draft BO (pg. 28) and Cumulative Effects section of the draft BO (pg. 62).

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 4b: The commenter suggests that the draft BO inaccurately states that wild ungulates have occurred in the action area for time immemorial.

Response: The MNF suggests that the BO pg. 44 sec 2.3.5 sentence 1 be omitted as it does not support the analysis of the draft BO.

The comment response team has not identified any needed adjustments to the BA. This comment may require an editorial adjustment to the final BO.

Comment 4c: The commenter suggests that NMFS has incorrectly characterized and considered the effects from recreation on critical habitat within the action area as minor human disturbances, and references personal observations of extensive recreational impacts in critical habitat.

Response: Recreation management is not within the scope of the proposed action. The MNF believes that the draft BO has accurately characterized the impacts of recreation on critical habitat within the action area in the Baseline section, which draws on discussions contained in prior ESA section 7 consultations with MNF.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 5: The commenter again raises concerns about the BO analysis and consideration of Figure 3, wild horse use and locations, herd estimates, amount of time horses spend in riparian areas, pre-season monitoring, effects of fences on horse use, and literature used to conclude that wild horses will not impair adult steelhead behavior nor interrupt spawning (all 4 paragraphs of comment 5).

Response: See previous responses regarding Figure 3 (Comment 3a), wild horse use and locations (Comment 3a, 3c, and 3e), herd estimates (Comment 1c), the amount of time horses spend in riparian areas (Comment 3a, 3b, and 3c), pre-season monitoring (Comment 1a), effects of fences on horse use (Comment 3c), and literature used (Comment 3d). Additionally, the MNF has no information to support commenter's assertion that horse crossing locations are preferentially selected by steelhead for spawning. The draft BO (pg. 47) concludes that it is extremely unlikely that any steelhead adults or redds will be disturbed by the proposed action.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 6: The commenter suggests that due to numerous inaccuracies in the draft BO, its estimate of take is likely wrong.

Response: We disagree with the commenter's assertions. All assertions raised in this comment have previously been addressed, see above responses.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 7a: The commenter questions the assumptions in the draft BO that a) fewer horses will result in less horse use of riparian habitats; and b) horse numbers are a more important factor than weather, season, and habits. The commenter further questions why significant impacts are still being observed if the population is indeed at 200.

Response: The 1983 Utilization and Distribution Study referenced on page 24 of the BA is the basis for the proposed action in the 2007 Murderers Creek Wild Horse Management Plan and assertion that fewer horses result in less impacts. The 1983 study is the best available information regarding the habitat effects at a specific population size. The 1983 study was used in concert with more recent data collected by the MNF in assessing the impacts of wild horses. The factors of weather, season, and habits can be observed through the extent and distribution of areas of concentrated use. The commenter's findings of significant impacts are currently disputed in court by the Forest Service and its experts. It should be noted that the MNF and PD are initiating a new analysis for consideration in our development of a revised Murderers Creek Wild Horse Management Plan. This plan is expected to undergo ESA section 7 consultation.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 7b: The comment in the second paragraph has been addressed through previous responses, with the exception that the commenter suggests the NMFS has not provided a rational basis for using herd size as an extent of take.

Response: This consultation is limited to the 2007 Wild Horse Plan which links to management activities tied to AML. The best information available (in the Wild Horse Plan) indicates that when herd size is at the 200 level, significant damage was observed. MNF's ability to manage wild horse impacts to steelhead critical habitat is focused on the adjustment of herd numbers through gathering, and horse herd numbers are an indication of effectiveness of herd management. NMFS determines the extent of take based upon the action agencies available management tools.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 7c: The commenter suggests that NMFS must consider effects of this consultation on grazing activities of permittees.

Response: This consultation is limited to the 2007 Wild Horse Plan; this comment is outside the scope of the proposed action.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 7d: The commenter suggests that NMFS should require the MNF to use bank alteration as the extent of take for wild horses.

Response: Wild horses are a federally protected species. They utilize a landscape year-round at varying levels given seasonal changes in vegetation. We cannot control the timing, intensity, or duration in which they utilize a specific area within a landscape. We can however control the population size which reduces the overall impacts to the landscape. At AML we expect the level of impacts to be minor and not warrant the same level of intensive monitoring that is required of permitted livestock grazing. Livestock grazing is a permitted use that requires the application of allowable use indicators, such as bank alteration. The use of indicators is a key component of livestock management where grazing is managed through controlling the timing, intensity and duration of grazing. Indicators are used in determining the intensity and duration of grazing in a particular area. Livestock can be moved to another pasture or entirely removed from an allotment as monitoring information indicates the level of use is nearing or exceeding an indicator(s).

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 7e: The commenter questions why the draft BO found that 200 head is acceptable when it also found that 140 head or less is what is necessary to stay within the allowable extent of incidental take. Further, they question if the herd size has been excessive for such a duration that the impacts require a herd size far less than 140 head to provide time for the system to recover so that it can again support a herd within the range proposed by the MNF.

Response: NMFS determined in their draft BO that the species can sustain the impacts of a 200-head horse herd for two years during which further gathers would take place to achieve the lower end of AML. Further, the proposed action describes the MNF intent to conduct gathers

annually until a population size near the lower end (50 head) of the AML is achieved. NMFS considered in their ITS that reducing the horse herd to the lower end of AML would result in a slower natural increase of herd size and subsequent reduced impacts within the Territory that would allow the Territory time to recover from years when the herd size exceeded AML. This comment is likely moot given that the current population estimate is approaching the lower end of AML.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

Comment 8: The commenter suggests that the analysis of impacts to Chinook salmon Essential Fish Habitat is inaccurate, since it is founded on the same inaccurate information as the steelhead analysis. The commenter additionally suggests that Chinook salmon are not known to run up the South Fork Murderers Creek.

Response: We disagree with the commenter's assertion that the steelhead analysis, and thus the Chinook salmon EFH analysis, is inaccurate. The assertion raised in this comment has previously been addressed, see above responses. Additionally, Chinook salmon EFH is designated in areas of historical occupation by the species, which does not necessarily reflect the species' current distribution. NMFS therefore must consider the South Fork Murderers Creek since it is currently designated as EFH.

The comment response team has not identified any needed adjustments to the BA or the draft BO.

MNF Comments -

Comment 1: The incidental take statement (ITS) twice refers to "applicants" in the terms and conditions on page 68. These references to "applicants" should be removed since there are not any applicants associated with this federal action. Department of Justice (DOJ) is allowing plaintiffs to review the draft BiOp as part of a settlement agreement, but they are not applicants. Definition of "applicant" is in 50 CFR 402.2.

Response: Comment discussed on December 4, 2012 conference call between MNF and NMFS; comment does not require any adjustments to the BA, and NMFS acknowledges comment will require editorial change for final BO.

Comment 2: The 2 year extent of take limitation for CY 2013 and 2014 is a population size of 200 animals or fewer. Term and Condition (T&C) 1a states: *If the estimated wild horse*

population, plus 20 percent annual recruitment, will exceed 200 animals in the fall of calendar years 2013 or 2014, conduct horse removal actions to reduce the estimated population size to 140 animals or fewer before the end of the calendar year. Therefore, the latter half of the sentence is incorrect. T&C #1 should state if 200 animals are exceeded during CY 2013-14, then conduct horse removal to reduce the population size to 200 animals or fewer before the end of the calendar year rather than 140 animals or fewer.

Response: Comment discussed on December 4, 2012 conference call between MNF and NMFS. Comment is moot due to the current wild horse population estimate currently within AML and below the 100-head average. This comment does not require any adjustments to the BA or draft BO.

Comment 3: Since the number of horses removed this year is changing, the statement on page 5 regarding status of horses removed should be dropped. Since BLM will accept 160 horses from the Forest this CY, perhaps NMFS should use 160 horses rather than 200 for their projected horse removal this CY.

Response: Comment discussed on December 4, 2012 conference call between MNF and NMFS. Updated horse gather information makes this comment moot. MNF recommends amending BO pg. 5 pgf. 3 line 3 to read “As on December 12, 2012, MNF has gathered and removed 182 wild horses from the Murderers Creek ...” NMFS has acknowledged this may require an editorial change to the draft BO. No adjustments to the BA are required.

Comment 4: References to the duration of the consultation vary.

- a. Page 5, 1st paragraph – States consultation addresses a 20-year Plan through 2027, which is the timeframe of the proposed action under consultation.
- b. Page 62 – States next 20 years, but should state next 15 years through 2027 if you refer to page 5.
- c. Page 64 – States 2012-2030 duration for analysis of climate change. This analysis time period should match the time period through 2027.

Response: Comment discussed on December 4, 2012 conference call between MNF and NMFS; comment does not require any adjustments to the BA, and NMFS acknowledges that the statement regarding timeframe for the proposed action is correctly displayed in page 5, 1st paragraph of the draft BO, and that the additional two references to consultation timeframe will be adjusted in the final BO to reflect this.

Comment 5: The MNF acknowledges errors in a table included in the BA regarding horse gathers and population estimates that was included in the draft BO as Table 11 on page 50.

Response: The MNF has provided an updated table to NMFS for inclusion in the final BO. See Stout Comment 1c.

Comment 6: Page 48 sec. 2.4.1.2 under the Horse Census heading states “The BLM Wild Horse Lead for Oregon and Washington normally conducts the wild horse surveys...” This statement needs to be reworded to read “*The Blue Mountain Ranger District Wild Horse Specialist conducts the wild horse surveys, with assistance from the BLM Wild Horse Lead for Oregon and Washington and a representative from Prineville BLM*”.

Response: Comment discussed on December 4, 2012 conference call between MNF and NMFS; comment does not require any adjustments to the BA, and NMFS acknowledges comment may require editorial change for the final BO.

PD Comments –

Comment 1: The main concern with this draft biological opinion is that many of the effects analysis is based on the false premise that wild horse use is limited in riparian areas compared to other habitat types in the HMA and also compared to livestock. I would recommend reviewing Kaufman and Krueger 1984 and Crane et al 1997. I can provide both of these references if necessary.

Response: This comment was discussed and resolved at the November 28 meeting. This comment was resolved through discussions of wild horse habits in the Murderers Creek WHT. Changes made to the draft BO as a result of PD Comments 3, 4, 5, 7 and 8 supported resolution of this comment. MNF staff discussed with the team their observations of wild horse use and their use patterns. The Kaufman and Krueger and Crane et al papers were reviewed and found that the findings of the articles are generally consistent with MNFs observations that wild horses rely on a variety of habitat types with riparian areas being utilized for watering and foraging of the terrace and benches associated with watering locations.

The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO

Comment 2: Page 29, section 2.3, second paragraph states “Murderers Creek lacks braided channels and side channels and those present are dewatered as flows drop in the summer.” This sentence infers that braided channels and perennial side channels are expected in Murderers

Creek. The channel types that form Murderers Creek are all single thread channels with some channel types having overflow channels to dissipate energy. The formation of braided channels and perennial side channels would be considered negative and would indicate a change of management is needed.

Response: This comment was discussed and resolved at the November 28 meeting. The comment response team discussed the stream types that are present in Murderers Creek and agreed to minor editorial changes to the draft BO. Changes were made to address the proper attributes of Murderers Creek and its tributary stream types. No changes are needed to the BA.

Comment 3: Page 46, section 2.4.1.1, 7th paragraph states “Unlike cattle, wild horses do not tend to dwell in and around streams other than to drink or when traversing the area on traditional routes.” Remove the first two words of this quote. Cattle and horses generally utilize riparian areas the same way early in the year when steelhead are spawning. Probably the biggest difference is that horses are much more likely to browse woody vegetation.

Response: This comment was discussed and resolved at the November 28 meeting. MNF staff stated that their data does not support the statement that horses are more likely to browse woody vegetation. The phrase “unlike cattle” was removed from the sentence in the draft BO. Comparisons to livestock were removed and language regarding wild horse use of riparian areas was revised.

The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO.

Comment 4: Page 47, section 2.4.1.1, 4th paragraph states “...the wild horse’s general habit of not concentrating in riparian areas like livestock, and the high stream flows when eggs and pre-emergent fry are in redds, it is extremely unlikely that wild horses will step on occupied redds and would certainly be within the background level of occurrence by elk or deer.” Remove the livestock reference. At the time of year that steelhead are spawning, cattle generally go to water once a day usually between 10:00 and 2:00 than had back up the hill for thermoregulation and where the vegetation is more palatable. Also see response for Page 46.

Response: This comment was discussed and resolved at the November 28 meeting. Edits were made to the draft BO during the meeting by removing the connected reference of horses to livestock.

The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO.

Comment 5: Page 48 section 2.4.1.1, 2nd paragraph, Kauffman and Krueger 1984 Citation: This paper described impacts to riparian areas due to different grazing scenarios. It did not analyze time spent in the riparian areas by either horses or cows. Recommend removing the last sentence from this paragraph.

Response: This comment was discussed and resolved at the November 28 meeting with minor editorial changes to the draft BO. The last sentence was removed in accordance with the comment and the reference was removed from the paragraph.

The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO.

Comment 6: Page 48, section 2.4.1.1, 3rd paragraph states “Juvenile MCR steelhead may respond by leaving near shore cover and entering open water where they are more vulnerable to predation. This could lead to death or injury of these individuals. Wild horses entering streams may also cause juvenile steelhead to temporarily abandon other critical behaviors such as feeding.” It is my professional opinion that the above statements are highly unlikely to occur. Recommend removing this paragraph unless there are some studies that can be referenced.

Response: This comment was discussed and resolved at the November 28 meeting. NMFS added references to support the statements referenced in the comment.

The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO.

Comment 7: Page 51, 2nd paragraph under Riparian Vegetation section: “These animal traits and habitat use patterns support the understanding that wild horses do not languish in riparian areas.” Where did the behavior stuff come from? Recommend removing this paragraph because it does not follow what is in the literature.

Response: This comment was discussed and resolved at the November 28 meeting. The MNF, PD, and NMFS discussed the literature used in the addressing of wild horse behavior and concurred with the assessment in the draft BO. The draft BO was reworded to use the term ‘lounge’ which makes it more consistent with edits made as a result of Comment 3.

The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO.

Comment 8: Page 56, 1st paragraph, last sentence: “This is because wild horses tend to spend little time browsing on shrubs in riparian areas as explained in the description of their behavior, earlier.” Recommend removing because the statement is not correct. Unlike cattle, horses have both upper and lower teeth, which aid them in browsing woody vegetation. In my personal observations horses tend to browse all year, while cattle generally change to browsing when herbaceous material is either lacking or not palatable.

Response: As stated in Comment 3 the MNF’s data does not support this observation. Browse in the Murderers Creek WHT is low and well within background levels in the absence of livestock grazing. Therefore, the MNF has concluded that the wild horses do not browse year-round and have little preference for woody vegetation. Following the discussion by the response team, MNF and PD concluded that NMFS can disregard this comment.

The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO.

Comment 9: Page 61, Direct effects to juveniles; Recommend using the same justification as for adults. “..but unlikely to be measurable or above background levels for other large ungulates.”

Response: This comment was discussed and resolved at the November 28 meeting. NMFS added references to support the statements referenced in the comment, see Comment 6. The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO.

Comment 10: Page 66, section 2.8.1, 2nd paragraph; Recommend removing the statement that “incidental take is reasonably certain to occur when juveniles are startled by wild horses and displaced from preferred areas” This is highly unlikely to occur and would not be measurable.

Response: This comment was discussed and resolved at the November 28 meeting. NMFS added references to support the statements referenced in the comment, see Comment 6.

The comment response team has not identified any needed adjustments to the BA or any further edits to the draft BO.